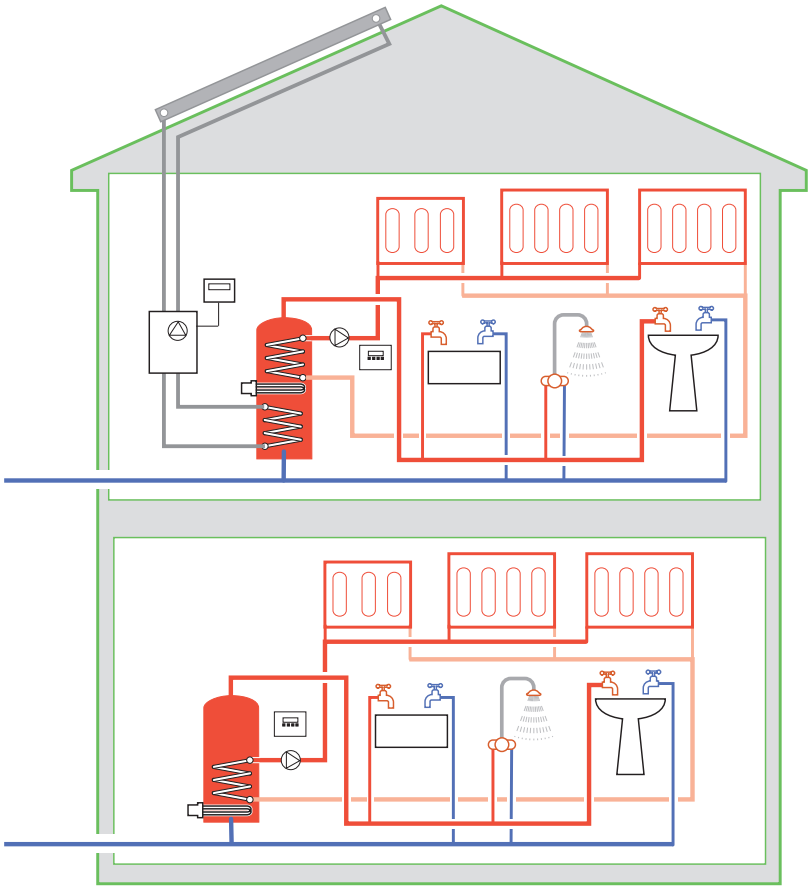
heating products

electrastream
controllable electric boilers

User and Installation Manual

Single and Twin Coil Models

For owners, installers and service engineers



A complete cost effective solution for Hot and Cold water supply and Electric Central Heating with water filled radiators, suitable for Self-contained Flats, Small Dwellings, Offices, Home Offices and Granny Annexes.

9 kW (30,000 Btu) - for Heating and Hot Water

Twin Coil Cylinder option available for SOLAR energy.

10/02/10

ISO 9001 REGISTERED FIRM
WRAS APPROVED PRODUCT
WRc APPROVED

Important Health and Safety Information for Installers and Service Engineers

Health and Safety at Work Act 1974

Consumer Protection Act 1987

COSHH Regulations 1988

The following information is given as a requirement of the above legislation.

Great care is taken by GAH (HEATING PRODUCTS) LIMITED to ensure that Electrastream systems are designed and manufactured to meet general safety requirements when properly used and installed as recommended in this manual.

It is the responsibility of Users and Engineers to ensure that adequate protective clothing and glasses are worn when working with the Electrastream system.

SEALS AND INSULATION

Insulation and sealing materials are used in the construction of the Electrastream cylinders. Units are sealed and when used in the manner for which they are intended the insulating and sealing materials do not present any known hazard. However always observe the following recommendations:-

1. Avoid inhalation of fibres or dust, wear face mask.

2. Avoid eye contamination by fibres or dust - wear eye protection.

3. As far as possible avoid any skin contact with Fibreglass Insulation, Glass Rope, Mineral Wool, Insulation Pads and Ceramic Fibre.

OTHER MATERIALS

SEALANTS, ADHESIVES AND PAINTS

Sealants, Adhesives and Paints are used in the construction of the Electrastream components. When used in the manner for which they are intended they do not present any known hazard.

ELECTRIC

The Cylinder Tri-Core Heater, Pump, Thermostats and Contactor Box all have electrical supply of 230V (enough to endanger life).

Always isolate before connection, adjustment, servicing and repair.

When the Tri-Core Heater cover is removed high power live electrical terminals are exposed.

ISOLATE THE TRI-CORE HEATER BEFORE REMOVING ITS COVER.

Earth protection - Earth Continuity Conductors must be fitted and must comply with IEE Wiring Regulations.

GAH (HEATING PRODUCTS) LIMITED will not accept responsibility for any damage or personal injury caused by not giving due consideration to the above safety recommendations.

In pursuance of a policy of constant development, GAH (HEATING PRODUCTS) LIMITED reserve the right to change Electrastream parts or design without notice, therefore certain details included in this manual may not be correct at the time of printing. Any modification and improvements detailed in this manual does not commit GAH to update any system previously supplied.

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Patent application 01514800.2
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Electrastream is a Trademark of GAH (HEATING PRODUCTS) LTD.

HTS REF GAH ELECTRASTREAM 10/02/10

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CONTENTS

Important Information ---------- 4

Section 1 Introduction

1-1 Introduction ---------- 5
1-2 System Layout ---------- 8
1-3 Parts Supplied ---------- 11
1-4 The Electrastream System ---------- 12
1-5 Tri Core Heater Operation ---------- 13

Section 2 Operator Controls

2-1 System Control ---------- 14
2-2 Electrastream Control Unit ---------- 16
2-3 Shut Off Valves ---------- 20
2-4 Temperature & Pressure Relief Discharge ---------- 22
2-5 Thermostatic Mixing Valve ---------- 22
2-6 Servicing ---------- 22

Section 3 Technical Information

3-1 Specifications ---------- 23
3-2 Dimensions ---------- 25
3-3 Wiring ---------- 29

Section 4 Installation

4-1 Building Control ---------- 31
4-2 Electrical ---------- 31
4-3 Hot Water System ---------- 33
4-4 Heating System ---------- 37
4-5 Expansion Discharge ---------- 40
4-6 System Pressure ---------- 43
4-7 Electrastream Connections - ---------- 44

Section 5 Commissioning

5-1 Commissioning ---------- 47

Section 6 Servicing

6-1 Routine Service ---------- 50

Section 7 Fault Finding

7-1 Fault Finding ---------- 52

Health & Safety ---------- 55

IMPORTANT
BEFORE STARTING THE INSTALLATION OF THE ELECTRASTREAM CHECK ALL COMPONENTS HAVE BEEN DELIVERED AND ARE IN SATISFACTORY CONDITION - Refer to 1-3 .

IMPORTANT INFORMATION

BEFORE STARTING THE INSTALLATION OF THE ELECTRASTREAM CHECK ALL COMPONENTS HAVE BEEN DELIVERED AND ARE IN SATISFACTORY CONDITION - Refer to 1-3.

Delivery

Standard Electrastream systems will be delivered wrapped on single pallet with cylinder together with box containing control box and loose components.

Pre-Plumbed Electrastream systems will be delivered wrapped on single pallet with cylinder, control box and all components fully assembled.

Pack should be lifted using suitable sized pallet truck or fork lift truck.

WEIGHTS OF PACKED CYLINDERS and COMPONENTS

Single Coil Systems			Single Coil Pre-Plumbed Systems			Twin Coil Pre-Plumbed Systems			Plus 'P' Accumulator		
Model	Pack weight	✓	Model	Pack weight	✓	Model	Pack weight	✓	Model	Pack weight	✓
BEL125	55kg		BEP 125	71kg		BETP 210	177kg		200	35kg	
BEL150	60kg		BEP 150	76kg					300	50kg	
			BEP125R	77kg							

Storage

Prior to installation the cylinder and box should remain on its pallet with wrapping intact and stored upright. The cylinder and components must be stored safely in a dry, frost free environment and protected from accidental damage.

WARNING TO THE USER

DO NOT remove or adjust any component part of the unvented water heater: contact the INSTALLER.
In the event of hot water/steam being emitted at the discharge pipe or tundish, switch the system Off and contact installer - refer to Fault Finding section 7.

If the Electrastream system develops a fault or is not operating as expected: contact the INSTALLER.

IMPORTANT TO THE INSTALLER

This installation is subject to Building Regulation Approval, notify the Local Authority of intention to install.

Use only manufacturer's recommended replacement parts.

The following Information must be provided:-

INSTALLED BY:-

Name .....

Address .....

Tel. .....

Completion Date .....

ELECTRICS BY:-

Name .....

Address .....

Tel. .....

Completion Date .....

1-1 Introduction

GAH Electrastream Systems are protected pending patent applications.

Electrastream is a Trademark of GAH (HEATING PRODUCTS) LTD.

This Handbook has been compiled to assist in the Installation and Operation of GAH (HEATING PRODUCTS) LIMITED Electrastream domestic hot water and heating system.

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Notified Body NB 0558

After installation the Installer of the system should give full operating instructions to the householder for the Electrastream System. This User and Installation Manual must be left for the end user.

1-1.1 The Electrastream System

The Electrastream system by GAH (Heating Products) Ltd. has been developed as a cost effective solution for domestic hot and cold water and electric central heating with water filled radiators.

Electrastream is a 9kW - 30,000 Btu system suitable for flats, small dwellings, offices, home offices and granny annexes.

1-1.2 Electrastream Options Available

Consult GAH (Heating Products) Ltd.

1-1.3 Basic Principles

ELECTRASTREAM

Water in the unvented cylinder is heated by the high powered titanium electric tri-core heater. Hot water is drawn from the cylinder and mixed with cold water by a thermostatic mixing valve; this ensures safer lower temperatures at the hot water outlets.

The hot water within the unvented indirect cylinder also heats the water for the heating system via the indirect coil within the cylinder. The circulating pump for the heating system is controlled by a thermostat and programmable timer with override so that heat is available on demand, providing there is a supply of hot water.

ELECTRASTREAM PRE-PIPED

Operationally the same as the Electrastream but supplied pre-piped and assembled onto a mounting frame.

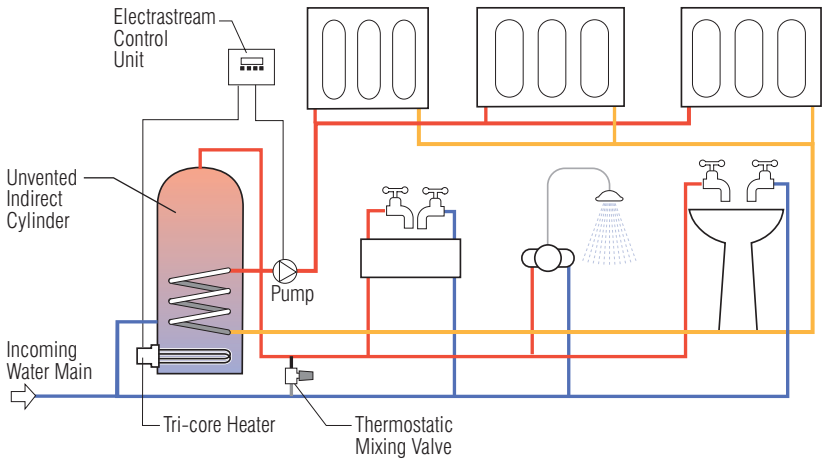


Fig. 1-1a Electrastream

1

ELECTRASTREAM TWIN COIL

Operationally the same as the Electrastream but supplied with a twin coil cylinder which enables the Electrastream to be used in conjunction with alternative energy systems e.g. Solar.

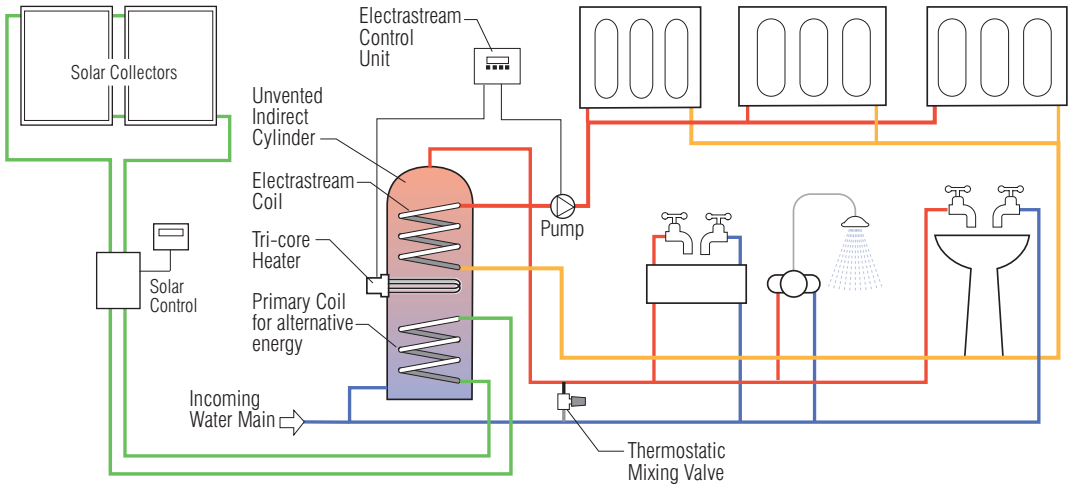


Fig. 1-1b Electrastream Twin Coil - typical solar arrangement

ELECTRASTREAM PLUS

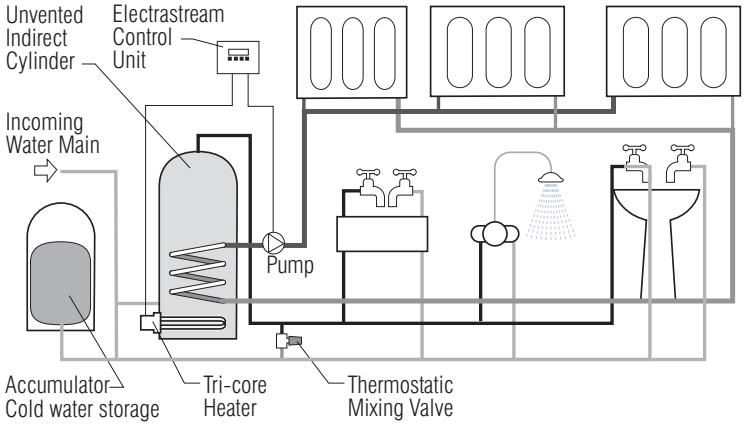


Fig. 1-1c Electrastream Plus

The Electrastream Plus system is supplied with a cold water storage accumulator.

The accumulator has an internally controlled butyl diaphragm, incoming cold water is stored within this diaphragm at mains pressure. The air space between the diaphragm and the accumulator case is pressurised, this balances the supply and maintains pressure to the unvented hot water cylinder and cold outlets. When hot and cold water outlets are turned on, the stored water from the accumulator supplements water from the incoming main, this results in consistent pressure and flow to all taps, showers and baths even when outlets are used simultaneously. Pressure will be sustained for as long as the accumulator is holding sufficient volume of water.

ELECTRASTREAM PLUS PRE-PIPED

Operationally the same as the Electrastream Plus but supplied pre-piped and assembled onto a mounting frame, the cold storage accumulator is supplied separately.

1-1.4 Electrastream System Features

ELECTRASTREAM AND ELECTRASTREAM TWIN COIL

1. Only water and electric services required.
2. No gas or oil - no Boiler.
3. Central heating with conventional water filled radiators.
4. Heat on demand 24 hours a day.
5. Can be timed for economy tariff.
6. Far more flexible heating control than storage radiators.
7. Hot water to taps and shower from unvented cylinder.
8. Hot water to outlets temperature controlled by thermostatic mixing valve.
9. Mains pressure to hot and cold outlets.
10. All plumbing, water storage and controls are within the dwelling - no header tank.
11. Low maintenance cost, no CORGI Landlord Certificate required.
12. 9kW titanium tri-core heater (combined 3 x 3kW).
13. Tri-core heater will still work should one or two of its three elements fail.
14. Stainless Steel Unvented Cylinder with 25 years guarantee.

Note
For components supplied with system refer to page 9.

Note
Further options are available consult GAH (Heating Products) Ltd.

ELECTRASTREAM TWIN COIL

1. Cylinder with primary coil for alternative energy source typically solar and ground source.

ELECTRASTREAM PLUS ONLY

1. Balanced hot and cold supply to taps.
2. All taps and showers at maximum system pressure.
3. Pressure maintained for both hot and cold taps even when other taps are open (subject to volume used).

Option	Model	Code	Cylinder	
Electrastream	Electrastream	BEL125	125 litre	
	Electrastream Pre-piped	BEP125		
	Electrastream	BEL150	150 litre	
	Electrastream Pre-piped	BEP150		
Electrastream Twin Coil	Electrastream Pre-piped	BETP 210	210 litre twin coil	
Plus				Accumulator
Electrastream Plus	Electrastream BEL125	BEL125P	125 litre	Model 200
	Electrastream Pre-piped BEP125	BEP125P		
	Electrastream BEL150	BEL150P	150 litre	170 litre
	Electrastream Pre-piped BEP150	BEP150P		
Electrastream Twin Coil Plus	Electrastream Pre-piped BETP 210	BETP 210P	210 litre twin coil	

1

1-2 System Layout

1-2.1 Electrastream

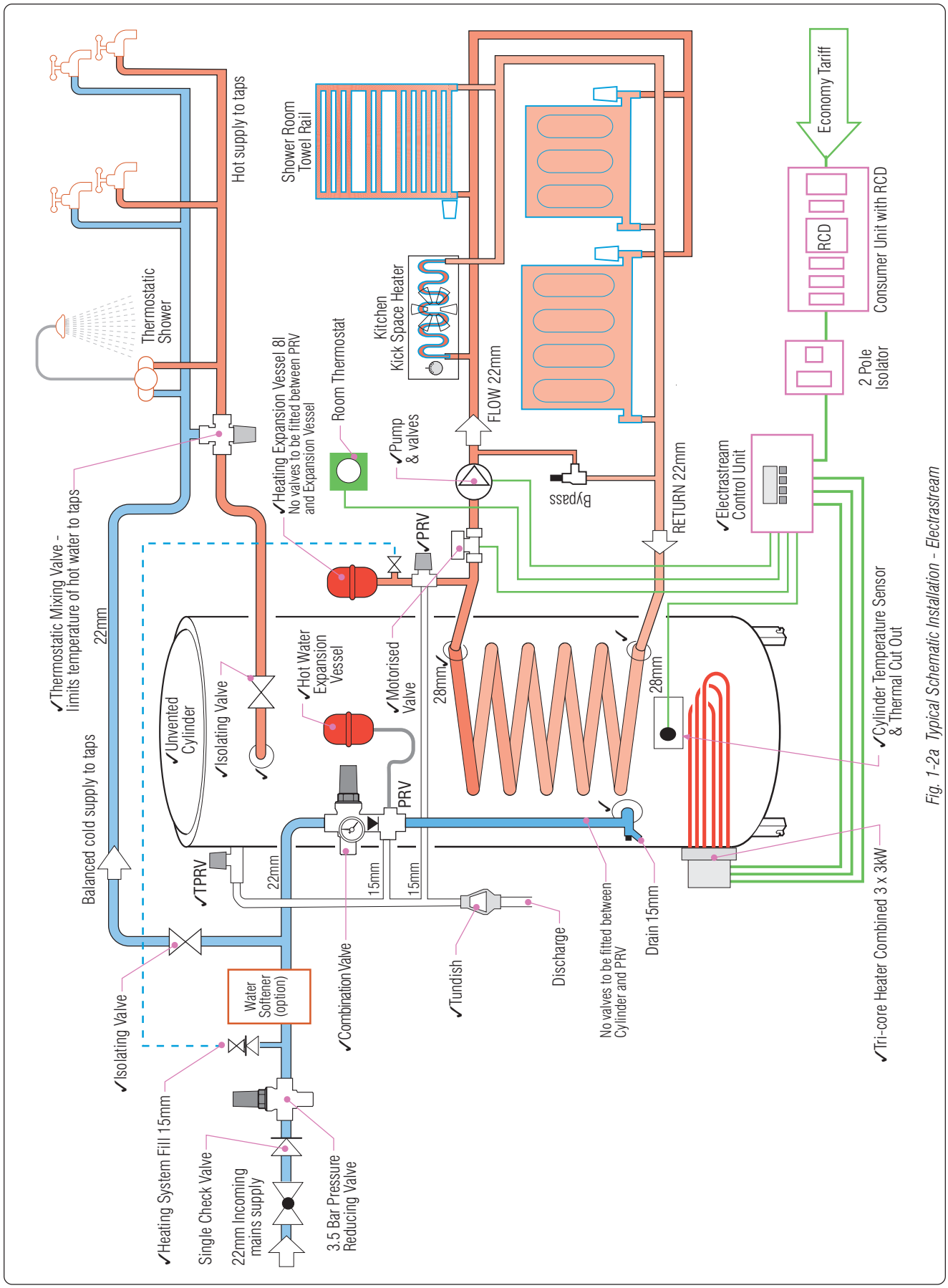


Fig. 1-2a Typical Schematic Installation - Electrastream

1-2.2 Electrastream Plus

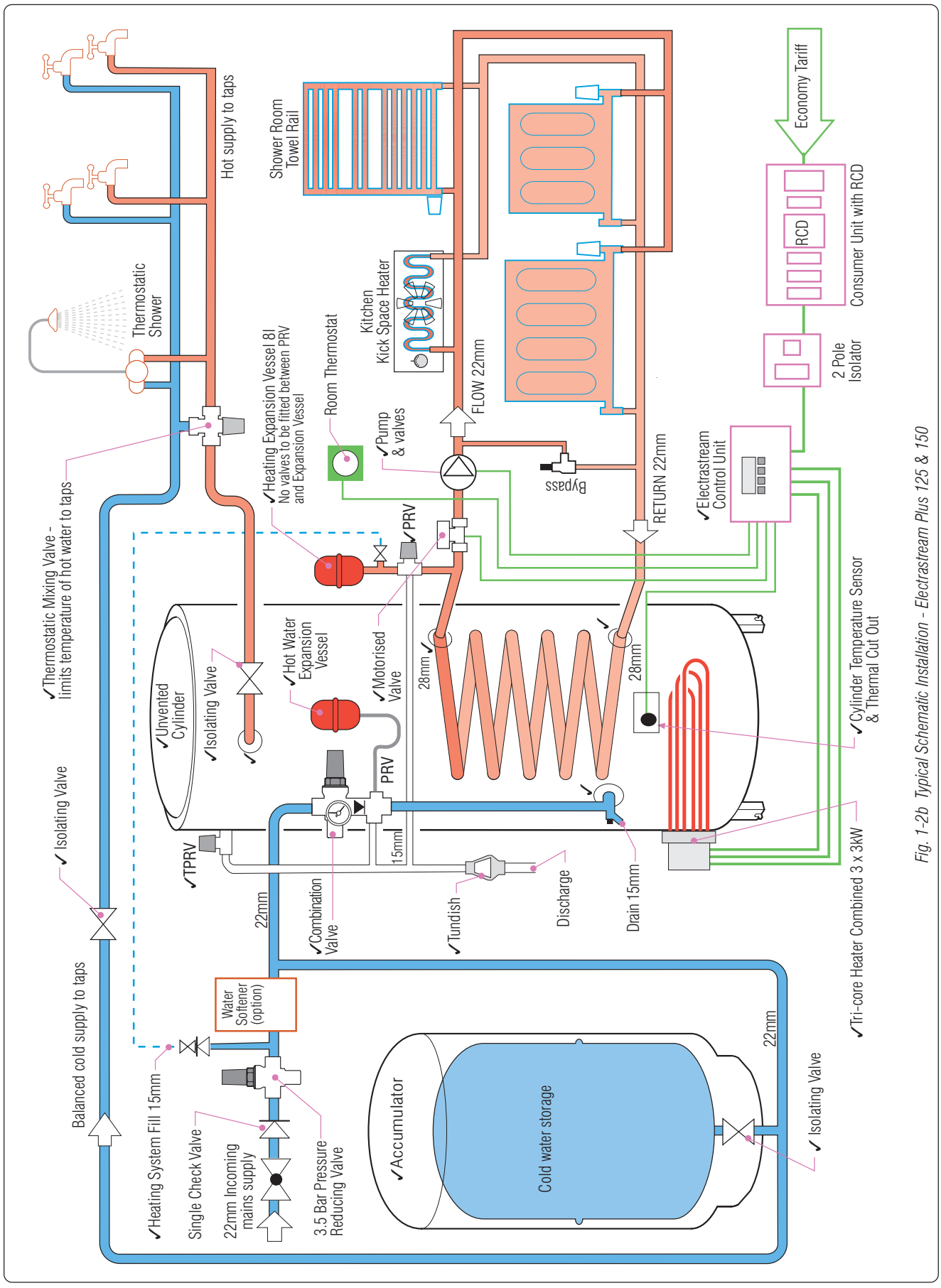


Fig. 1-2b Typical Schematic Installation - Electrastream Plus 125 & 150

1-2.3 Twin Coil

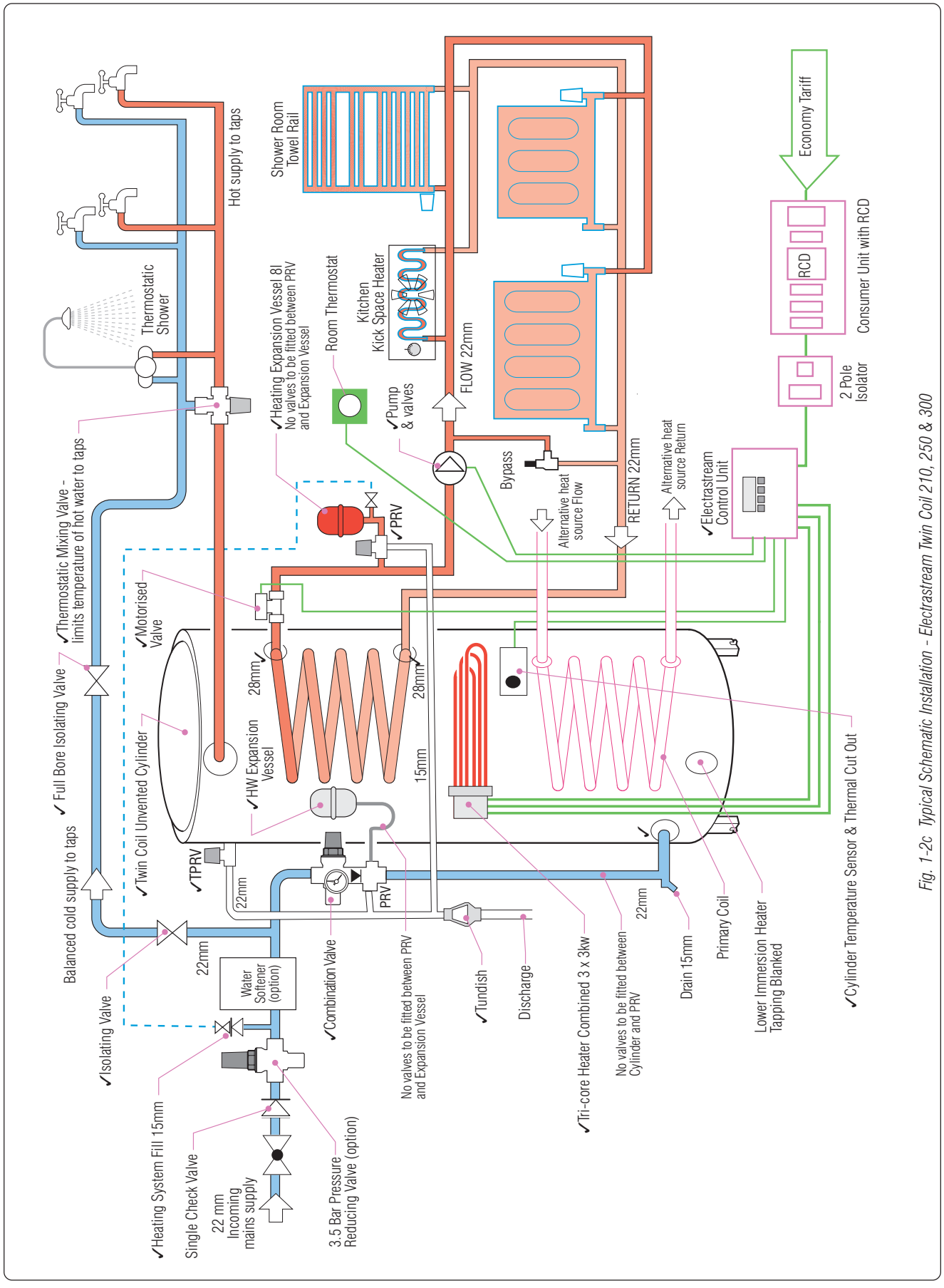


Fig. 1-2c Typical Schematic Installation - Electrastream Twin Coil 210, 250 & 300

1-3 Parts Supplied

Standard Electrastream systems will be delivered wrapped on single pallet with cylinder together with box containing control box, expansion vessels and loose components.

Pre-Plumbed Electrastream systems will be delivered wrapped on single pallet with cylinder, control box, expansion vessels and all components fully assembled.

Note
On Electrastream Pre-piped units, components are supplied already assembled.

Item	Part	Qty.	✓	Notes
1	Electrastream Control	1		C/w cylinder temperature sensor
2	Unvented Cylinder + Fittings Kit	1		Sized for selected system
3	9kW Tri-core Heater	1		Titanium Combined 3 x 3kW
4	GAH Circulating Pump	1		230V Single Phase
5	Pump Isolating Valves	2		22mm
6	Thermostatic Mixing Valve	1		Blends cold water with hot water from cylinder for taps.
7	DHW 8l Expansion Vessel & Kit	1		White - C/w Filling Loop, Pressure Gauge, TPRV & Bracket and Strap
8	Combination Valve	1		Includes PRV (Pressure Reducing Valve).
9	Cylinder Thermostat Box	1		C/w manual override stat.
10	MI Coupler 22mm x ¾" BSP Brass	4		1 - Cylinder Cold In 1 - Cylinder Hot Out 1 - Cylinder Heating Flow 1 - Cylinder Heating Return
11	22mm Full Bore Lever Valve	2		1 - Cold Supply to Taps 1 - Hot Supply to Taps
12	Motorised Valve	1		2 Port
13	Heating System 8l Expansion Vessel & Kit	1		Red - C/w Filling Loop, Pressure Gauge, TPRV & Bracket and Strap
14	Accumulator	1		Cold Water Storage Model 200l or 300l
15	22mm Full Bore Lever Valve	1		Accumulator Shut Off Valve

Electrastream Plus only

1-4 The Electrastream System

1-4.1 Hot & Cold Water Supply

Refer to fig. 1-2a for Electrastream.

Refer to fig. 1-2b for Electrastream Twin Coil

The incoming mains water supply is connected to the combination valve which is assembled to the unvented indirect hot water cylinder. The combination valve has an integral check valve. A single check valve is supplied, this is only required to be fitted if back syphonage is possible from any item fitted prior to the combination valve.

Note
All installations must comply with relevant regulations - refer to section 4-1.

Provision should also be provided in the cold supply for:-

1. Heating system fill.
2. Drinking water.
3. Water softener (when applicable).
4. Outside tap (when applicable).

The combination valve limits the incoming pressure to 3.5 Bar, it has an integral non-return valve and pressure relief valve (PRV).

Supply to the hot outlets is taken from the cylinder and mixed with cold water by the thermostatic mixing valve, this ensures that a safer lower temperature hot water is available at outlets.

Cold supply to all outlets is taken direct from the main supply. If the mains pressure is high (over 3.5 Bar) a 3.5 Bar pressure reducing valve is recommended.

1-4.2 Twin Coil - Alternative Heat Source

Note
The alternative heat source must be configured correctly to be used with the GAH Electrastream system.

Twin Coil Cylinders have two coils, the upper coil is connected to the Electrastream heating system. The Electrastream high powered titanium electric tri-core heater is positioned about halfway up the cylinder so that it is only used to heat the water in the upper part of the cylinder.

The lower coil is heated by the chosen alternative heat source (e.g. solar), this will heat the water in the whole cylinder when 'energy' is available resulting in optimum efficiency.

1-4.3 System Control

Note
The final fill of the heating system should include the correct percentage of suitable scale/corrosion inhibitor.

The Electrastream system is controlled by a purpose designed Electrastream Control Unit, this controls the hot water and heating ON/OFF times together with the heating pump and valve. The control also has a dedicated programme that ensures efficient use of electricity by selecting how many of the three immersion heater elements are required to meet the current demand for heating or hot water.

1-4.4 Heating System

The heating system is for water filled radiators on a standard 'sealed system'. The water for the heating is heated by being pumped through the indirect coil of the cylinder. A room thermostat and the Electrastream Control Unit's programmable timers control the circulating pump and motorised valve.

1-4.5 Electric System

The unvented cylinder is heated by a 240V, 9kW (combined 3 x 3kW) titanium tri-core heater. This is controlled by the cylinder temperature sensor and the Electrastream Control Unit.

Electrastream is designed to make full use of economy tariff electricity supplies and the wiring must be arranged to make full use of this.

1-4.6 Output

The tri-core heater provides 9kW (30,000 Btu) for heating and hot water.

1-4.7 Scale Protection

IMPORTANT All installations should have a scale protection device fitted and in areas known to have hard water, a water softening device is strongly recommended. The cylinder is not guaranteed against damage caused by scale. Higher water temperatures of 65°C and above can cause excessive scale.

GAH offer a range of quality Water Softeners, for information contact GAH (HEATING PRODUCTS) LTD.

GAH recommend and promote the use of scale prevention devices and water softeners in areas that are known to have hard water. Installed correctly they prolong the life of equipment and help prevent limescale formation in the pipework. Water softeners provide the advantages of soft water, as well as preventing scale build up on taps and shower heads.

Note

When a water softener is fitted, the take-offs for heating system fill, drinking water and outside tap (when applicable), must be positioned before the water softener.

Water softeners and any mains fed system must be of adequate capacity and should be installed with suitably sized hoses to prevent any possibility of flow reduction.

1-4.8 Frost Protection

When planning the installation location of both the accumulator and the unvented cylinder, consideration must be given to the risk of frost and the use of frost protection.

The design of the accumulator gives it a degree of frost protection enabling it to be located within the dwelling, loft space or garage without further protection.

The cylinder can also be installed within the dwelling or loft space without further protection.

Cylinders or accumulators must have frost protection when they are installed where low temperatures could be a potential problem. Cylinders can be protected by a frost thermostat.

To comply with Building Regulations, all necessary pipework must be suitably lagged.

1-4.9 Handling and Storage

The Electrastream system will be delivered fully wrapped and palleted.

Lift the package carefully using a safe and suitable lifting method.

Keep the packaging intact and store in a secure dry and weatherproof area prior to installation.

1-5 Tri-core Heater Operation

Note

Refer to 2-2.2 for display settings.

The three elements of the tri-core heater are switched on and off by the Electrasteam Control Unit. They have a staggered switch on sequence that prevents sudden high load on the power supply.

The control unit also limits the use of the elements for efficiency.

When the hot water within the cylinder is within 2° of the set (8) Target 65°C, only one element will be on.

When the hot water within the cylinder is between 2° and 4°C below the set (8) Target 65°C, then two elements will be on.

When the hot water within the cylinder is below 6°C of the set (8) Target 65°C, then all three elements will be on.

IMPORTANT
On twin coil cylinders the Electrastream tri-core heater must be fitted to the upper immersion heater tapping.

2-1 System Control

Note
On twin coil systems the alternative heat source supplements the electric.

The heating and hot water system is all electric. The hot water for the taps (outlets) and radiators is heated by the tri-core heater in the cylinder.

The system will have the following controls.

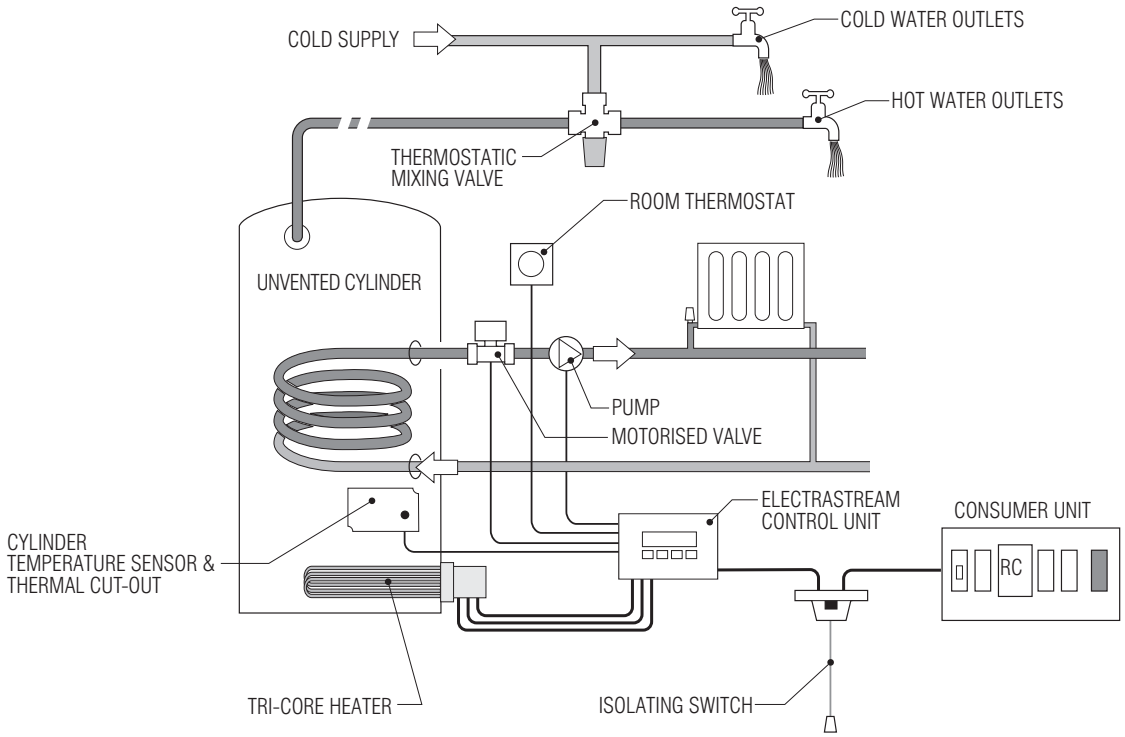


Fig. 2-1a Schematic of Typical Controls

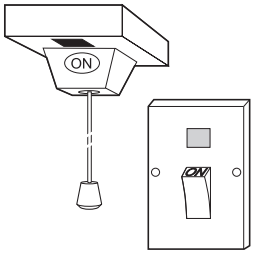


Fig. 2-1b Isolating Switch

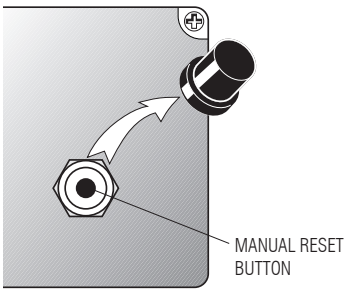


Fig. 2-1c Thermal Cut-Out Thermostat

2-1.1 Isolating Switch

The system will have a double pole isolating switch with neon and mechanical indicators. This could be a pull cord or wall mounted type.

When the switch is ON (neon on) the system is operational.

When the switch is OFF (neon off) no hot water or heating will be available.

It is advised to turn the switch off when hot water and heating are not required, i.e. holidays etc.

2-1.2 Electrastream Tri-core Heater

WARNING Unlike immersion heaters, the Electrastream tri-core heater does not have an internal thermostat, therefore the cover should not need to be removed.
When the cover is removed live electrical terminals are exposed.
ISOLATE THE TRI-CORE HEATER BEFORE REMOVING ITS COVER.

2-1.3 Over Temperature Cut-Out Thermostat

In the Electrastream temperature sensor box on the cylinder is the over temperature cut-out thermostat. This prevents the water within the cylinder from overheating.

The over temperature cut-out thermostat is a manual reset type, this means it has a small button that pops up when the thermostat has been tripped by overheating.

To reset the system after overheating, switch heating and hot water OFF, allow time for the water to cool, or run off some hot water, then remove the cap and press the button.

If the over temperature cut-out trips more than once, switch off the Electrastream isolating switch and contact your installer.

2-1.4 Heating Motorised Valve

When the room thermostat is calling for heat and the Electrastream control unit is set for heat ON, the heating motorised valve will open allowing water to the radiators.

Display icon 'Valve ⋁' indicates the valve is open.

2-1.5 Pump

The heating circulating pump is controlled by the Electrastream Control Unit in response to the room thermostat.

The pump has 3 speeds, it is normally set to speed 2 (II). Consult the Electrastream installer before changing this setting - see 4-4.3.

Display icon 'Pump ⋁' indicates the pump is ON.

IMPORTANT
When a programmable room thermostat is used it should only be set to call for heat when 'Economy Tariff' is available.

2-1.6 Room Thermostat

The room thermostat controls the heat within the property.

When the room thermostat is calling for heat and the Electrastream control unit is set for heat ON, the heating circulating pump will run, pumping water through the radiators.

Display icon 'Therm ⋁' indicates the room thermostat is calling for heat.

2-1.7 Tri-core Heater Elements

Note
Refer to 2-2 for the Electrastream Control Unit display and settings.

The three elements heat the water in the cylinder when the Electrastream control unit is programmed for a heat cycle. The elements are switched On and Off by the Electrastream control unit in response to the temperature within the cylinder as detected by the temperature sensor.

The elements have a staggered On sequence to prevent sudden loads - see 1-5.

Display icons 'Heat 1 ⋀, Heat 2 ⋀, and Heat 3 ⋀ indicate that the elements are heating.

If either of the Heat icons are displaying an exclamation mark **'!'** this indicates a fault with an element - see 2-2.3.

2-1.8 Residual Current Device (RCD)

Note
Testing the RCD will not cause loss of the Electrastream Control Unit settings.

The Electrastream system will be protected by a Residual Current Device, this will automatically switch Off the electric supply if an earth fault develops.

The RCD must be tested at least every three months, this is done by pressing the RCD 'Test' or 'T' button, this should switch the supply Off. Reset RCD to On after test.

If the RCD appears not to be working correctly contact your installer or a qualified electrician.

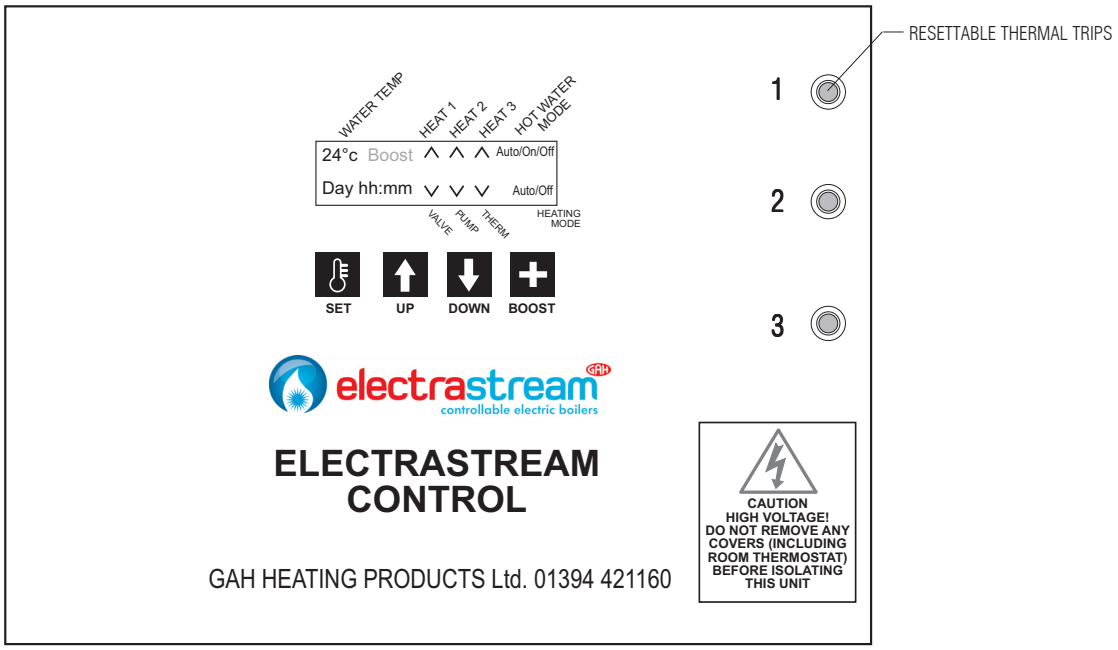
2-1.9 Alternative Heat Source Controls

For twin coil systems the alternative heat source will have its own controls - refer to manufacturers instructions.

The alternative heat source would normally be a cost effective method of heating the cylinder and should be used and controlled for optimum performance thus reducing heating costs.

2-2 Electrastream Control Unit

2-2.1 Control Unit Display - Normal Screen



For display settings see 2-2.2

For error displays see 2-2.3

Toggled by BOOST
'Boost' displayed - Heating On until next set OFF time

Displays actual water temperature in cylinder Set by (8) Target °c

Displays current Day and Time (24 hr clock)

WATER TEMP
HEAT 1
HEAT 2
HEAT 3
HOT WATER MODE
24°c Boost
Auto/On/Off
Day hh:mm
Auto/Off
VALVE
PUMP
THERM
HEATING MODE

Toggled by UP
Auto Timed
On Hot Water permanently ON
Off Hot Water permanently OFF

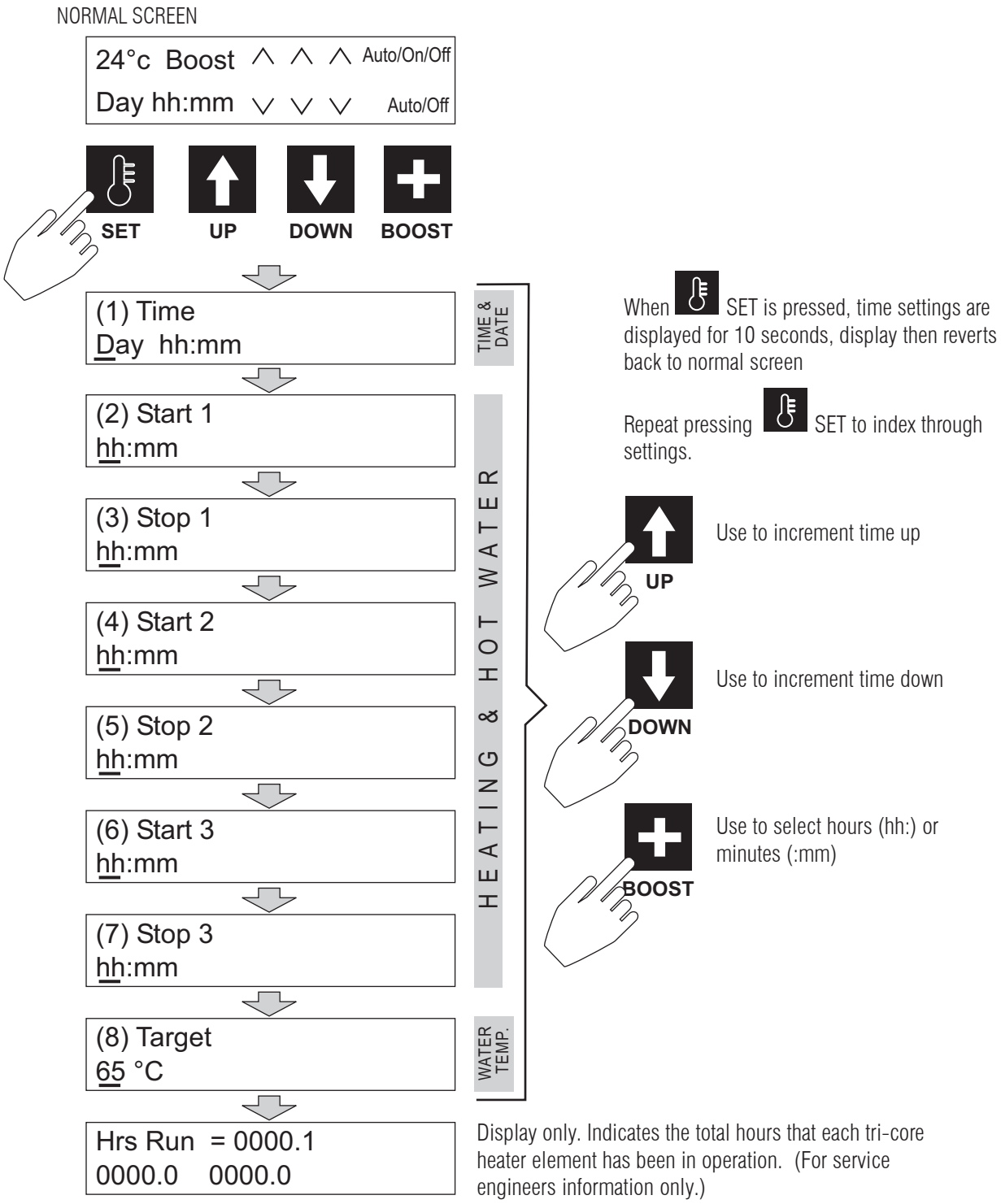
Toggled by DOWN
Auto Timed
Not available when HOT WATER MODE is Off
Off Heating Permanently OFF
Notes:- Select to turn heating off.
For Heating On use Boost.

SET UP DOWN BOOST

HEAT 1 ∧	Indicates Element 1 is ON	HEAT 1 ! Indicates heater element has failed - see 2-2.4
HEAT 2 ∧	Indicates Element 2 is ON	HEAT 2 ! Indicates heater element has failed - see 2-2.4
HEAT 3 ∧	Indicates Element 3 is ON	HEAT 3 ! Indicates heater element has failed - see 2-2.4
VALVE ∨	Indicates Heating Valve is OPEN	Heating on
PUMP ∨	Indicates Heating Pump is ON	
THERM ∨	Indicates Room Stat is calling for heat	
TEST 1.....5	Indicates heater test is being performed after midnight, this may take up to 30 minutes	

Fig. 2-2a Electrastream Control Unit - Normal Screen

2-2.2 Display Time Settings



Notes:-
All times are given in 24 hour clock.
Maximum cylinder temperature setting (Target °C) is 70°C.

For error displays see 2-2.3

Fig. 2-2b Electrastream Control Unit - Display Settings

2-2.3 Error Displays

When any of the following errors are displayed call service engineer.

ERROR 1

When 'Error 1' is displayed it indicates a faulty or disconnected temperature sensor. Heating is disabled.

ERROR 2

When 'Error 2' is displayed it indicates:-

1. The auxiliary 5 amp fuse has blown, or
2. The pump, motorised valve or room thermostat is faulty, or

Heating is disabled.

ERROR 3

When 'Error 3' is displayed it indicates that all heater elements failed heater test. Heating is disabled.

ERROR 5

One or more of the controller 'set', 'up', 'down' or 'boost' buttons is stuck or held down.

HEAT 1 **!**

When **!** is displayed under Heat 1, Heat 2 or Heat 3 it indicates a tri-core element has failed. Check the resettable thermal trips in the Electrastream Control Unit - see 2-2.4.

2-2.4 Element Resettable Thermal Trips

Each of the three elements of the tri-core heater is protected by a 16amp Resettable Thermal Trip, these have their reset buttons located on the front of the Electrastream Control Unit.

In the event of electrical overload on an element the relevant thermal trip will trip out, when this occurs the button will pop out. Also the control screen will display '!' under Heat 1, Heat 2, and/or Heat 3 see fig. 2-2a.

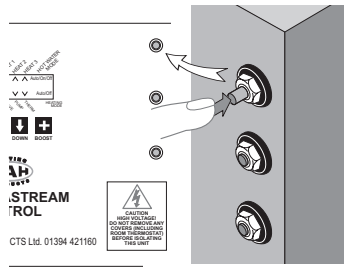


Fig. 2-2c Resettable Thermal Trips

To reset the thermal trip:-

1. Turn OFF the Electrastream mains isolating switch - see 2-1.1.
2. Look at the three buttons; button/s that are protruding have tripped out.
3. Press the button in, if the button stays in when the power is turned on, then trip has been reset. However if the button pops out again a possible fault exists - contact the installer.

The Electrastream will still operate with one or two elements working, but this is not satisfactory and the installer must be contacted to rectify the fault as soon as possible.

2-2.5 Economy Tariffs

Regional electricity suppliers have their own 'Off-Peak' tariffs that will provide an economical supply of power for the Electrastream system.

It is vital that the time settings of the Electrastream control unit are set to make the most use of the available 'Off-Peak' tariffs.

2-2.6 Normal Tariffs

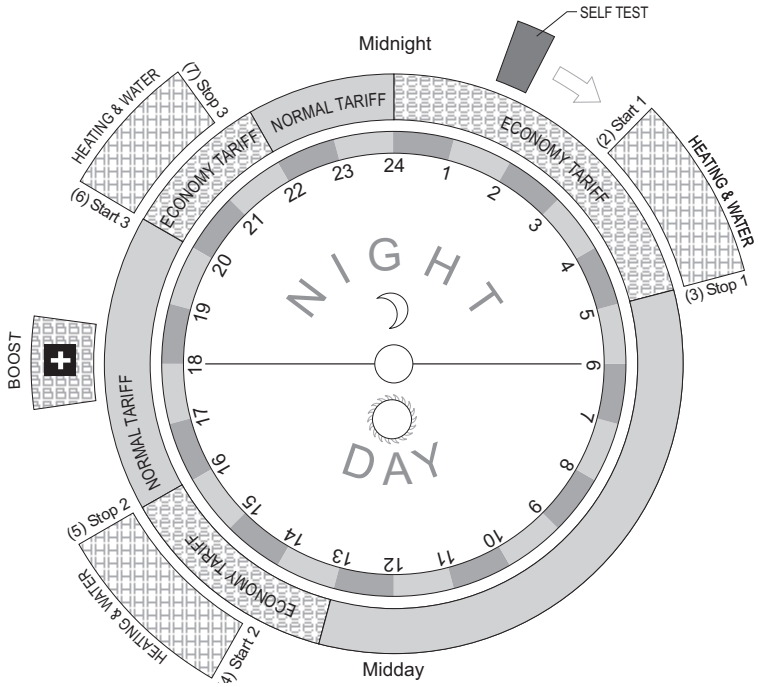
Normal tariffs are at all times that are not designated for 'Off-Peak', the cost of electricity during normal times will be more expensive. Therefore avoid setting heating and hot water ON during these periods.

IMPORTANT

Operating the Electrastream during normal tariffs will increase running costs.

2-2.7 Setting Heat and Hot Water Requirements

Figure below shows a 24 hour clock with typical use of the Electrastream during 'Off-Peak' economy 10 settings.



Note:-

Self Test

After 3am each day the unit carries out a self test period for approx. 30 minutes. This can be overridden if required.

All times fall within Economy Tariff

Start 1	- 03.00 (3am)	Start 2	- 14.00 (2pm)	Start 3	- 20.00 (8pm)
Stop 1	- 05.00 (5am)	Stop 2	- 16.00 (4pm)	Stop 3	- 21.30 (9.30pm)

IMPORTANT

Operating the Electrastream during normal tariffs will increase running costs.

Note:-

** The electricity supply company has to make special arrangements to the property's electrical supply to enable Electrastream to be used during both 'off-peak' and 'normal' tariffs- consult the installing electrician.*

'Boost ✚' can be used at any time during Economy or *Normal Tariff to provide heating and hot water.

To turn hot water and heating OFF during ON periods (auto) press ⬆ twice. It will require switching to Auto again when required.

To turn heating only OFF during ON period (auto) and during 'Boost' press ⬇. It will require switching to Auto again when required.

To turn hot water only ON during OFF periods (auto) press ⬆. It will require switching to Auto again when required.

To turn hot water and heating ON during OFF periods (auto) press ⬆ then ⬇. Both will require switching to Auto again when required.

2-3 Shut Off Valves

The Electrastream installation will have a number of shut off valves, the location of these will be dependent on the installation - fig. 2-3a shows typical layout.

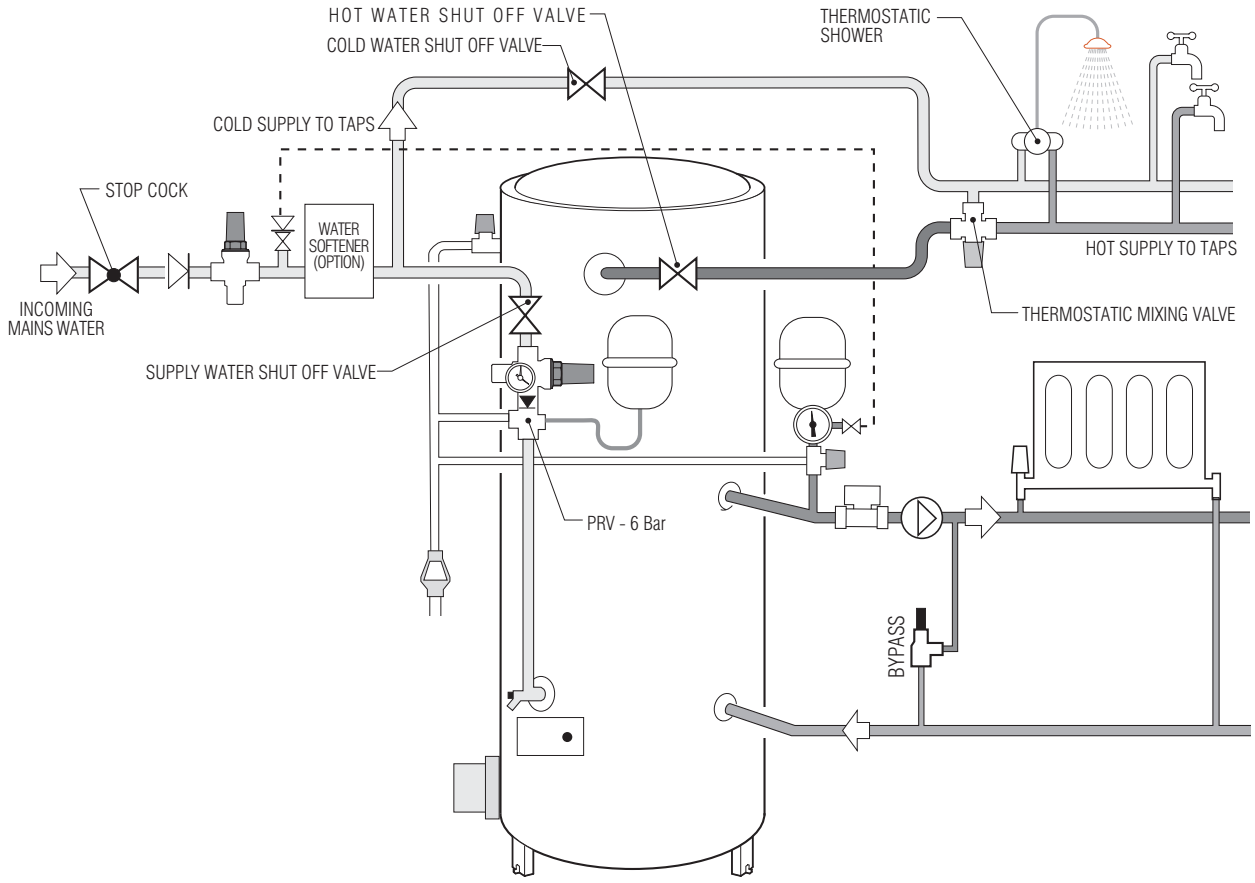


Fig. 2-3a Typical Shut Off Valve Locations - single coil shown

IMPORTANT Before closing ANY valve, switch OFF the Electrastream Isolating Switch.

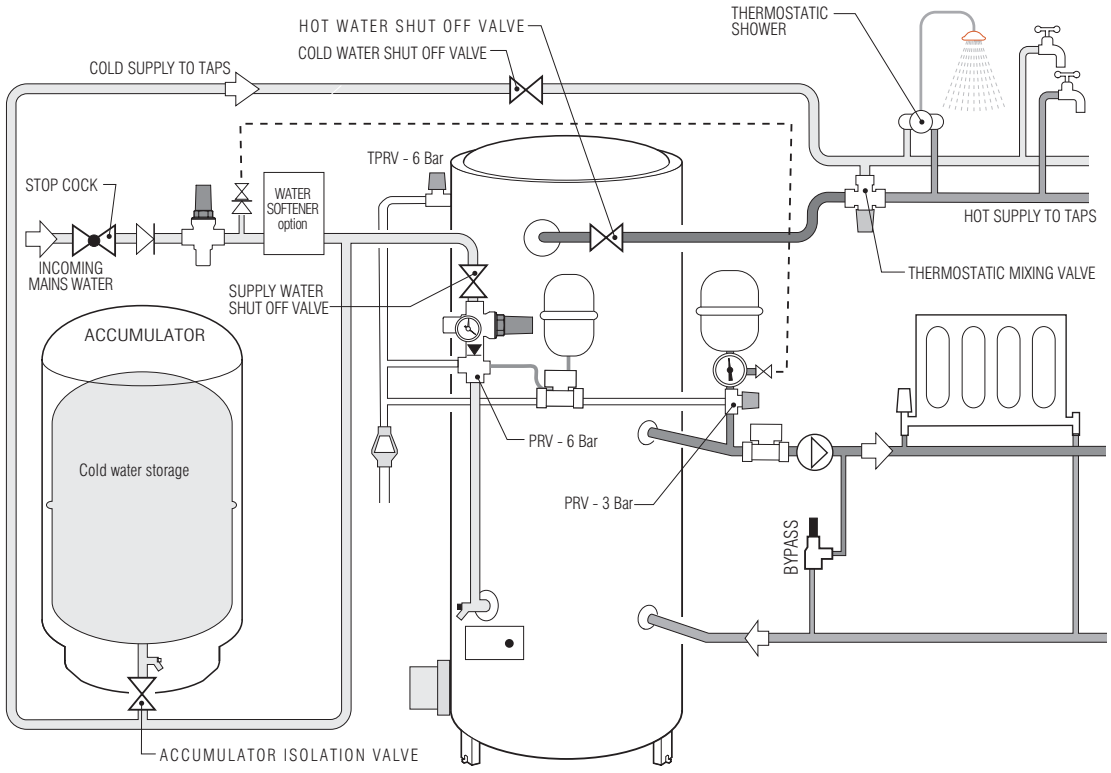


Fig. 2-3b Typical Shut Off Valve Locations - Electrastream Plus

Note

When opening the stop cock turn the valve fully open then close ½ turn, this prevents the valve sticking.

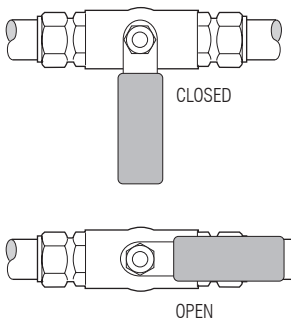


Fig. 2-3c Valves

2-3.1 Stop Cock

Normally located at the point where the mains supply enters the dwelling.
Shuts off the mains water supply to the dwelling.

2-3.2 Double Check Valve (If fitted)

Normally located after the Stop Cock. Prevents water back-feeding to main.
Shuts off the mains water supply to the dwelling.

2-3.3 Cold Water Shut Off Valve

Located in the cold feed to the taps/outlets.
Shuts off the cold water to the taps/outlets.

2-3.4 Supply Water Shut Off Valve

Normally located where the cold supply connects to the combination valve on the cylinder.
Shuts off the cold supply to the Electrastream system.

2-3.5 Hot Water Shut Off Valve

Normally located where the Domestic Hot Water feed comes from the cylinder.
Shuts off the hot water to the taps.

2-3.6 Accumulator Isolating Valve

ELECTRASTREAM PLUS ONLY
Located in the feed from the accumulator. Isolates water in accumulator.

2-4 Temperature & Pressure Relief Discharge

Note
The Tundish or discharge pipe should remain visible, do not box in or cover up.

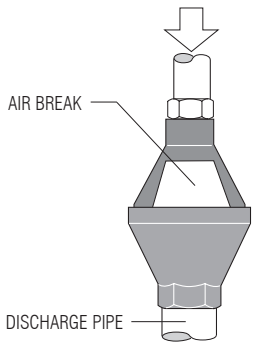


Fig. 2-4a Tundish

The Electrastream hot water cylinder has a Temperature/Pressure Relief Valve (TPRV); in the event of the pressure within the cylinder becoming too high, the TPR Valve will vent.

The cylinder connection for the TPR valve must not be used for any other purpose.

The heating system has its own Pressure Relief Valve (PRV) located adjacent to the heating expansion vessel; in the event of the pressure within the heating system becoming too high, the PRV will vent.

The combination valve also includes a PRV.

A Tundish will be fitted in the system, this should be located in the same space or compartment as the hot water cylinder. This device provides an air break when pressure is being vented from the cylinder TPRV.

The heating system PRV is normally also connected to the cylinder Tundish, alternatively it may have its own.

When pressure is being vented, water/steam will be evident at the Tundish and from the discharge pipe of the Tundish.

In the event of hot water/steam being emitted at the discharge pipe or tundish, switch the system Off and contact installer - refer to Fault Finding section 7.

2-5 Thermostatic Mixing Valve

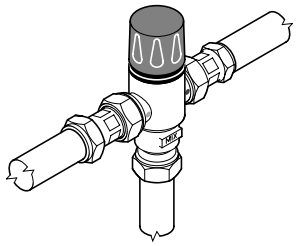


Fig. 2-5a Thermostatic Mixing Valve

The Mixing Valve will be fitted in the supply to the hot taps/outlets, it may be in a different location than the cylinder. This valve mixes hot water from the cylinder with cold water to provide hot water of a constant temperature at the taps.

The recommended maximum hot water temperature at the taps is 60°C.

The recommended setting of the valve is between No. 4 and 6 (49° to 58°C).

The Mixing Valve is factory set to the following approximate mixed outlet temperatures:-

Knob Position	Min	1	2	3	4	5	6	7	Max
Output Temp. °C	27°	32°	38°	44°	49°	53°	58°	63°	67°
					Recommended				

The mixing valve may have specific servicing requirements - refer to manufacturers instructions.

Higher water temperatures of 65°C and above can cause excessive scale in hard water areas.

WARNING
Do not set the water temperature too high as this can cause scalding especially to the young and old.

2-6 Servicing

It is recommended the system is inspected by an approved engineer once per year.

The service procedure is included in section 6.

3-1 Specifications

3-1.1 Cylinder & Hot Water System

Cylinder WRC Certificate No. 0605118

Electrastream Model	BEL125 BEP125	BEL150 BEP150	BETP210
Cylinder Capacity	125 litre	150 litre	210 litre
Coils	single	single	twin
Diameter	Ø505mm	Ø505mm	Ø505mm
Height	1015	1165	1405mm
Weight empty	25kg	30kg	29kg
Weight full	150kg	180kg	239kg
Maximum Water Supply Pressure	12 Bar	12 Bar	12 Bar
Operating Pressure	3.5 Bar	3.5 Bar	3.5 Bar
DHW Expansion Vessel Size (red)	12 litre	12 litre	18 litre
DHW E V Pre-charge Pressure	3.5 Bar	3.5 Bar	3.5 Bar
Cylinder TPRV Setting - Pressure	7 Bar	7 Bar	7 Bar
Cylinder TPRV Setting - Temp.	90ºC	90º	90º
Maximum Primary Pressure	3.5 Bar	3.5 Bar	3.5 Bar
Coil Surface Area (twin top)	0.67m²	0.78m²	0.67m²
Coil Surface Area (twin bottom)	-	-	0.67m²
Coil Rating (twin top Electrastream)	20.5kW	26.7kW	26.7kW
Coil Rating (twin bottom solar)	--	-	26.7kW
Cylinder Electrastream Volume	125 litre	150 litre	81.1 litre
Cylinder Solar Volume	-	-	118.9 litre
Reheat time (▲t=60°C) Electrastream	50 minutes	58 minutes	38 minutes
Heat Loss in 24hrs @ 60°C	1.7 kWh	1.9 kWh	1.23 kWh

3-1.2 Combination Valve

Electrastream Model	ALL
Pressure Reducing Valve	3.5 Bar
Maximum Pressure to P Red. V	12 Bar
Pressure Relief Valve (PRV)	6 Bar

3-1.3 Heating System

Electrastream Model	ALL
Expansion Vessel (red)	8 litres
Maximum System Expansion	7 litres
Pre-charge Pressure (as supplied)	1 Bar
Recommended Max. Charge Pressure	1.5 Bar
Maximum Working Pressure	3.5 Bar
Maximum Working Temperature	90°C
Heating Pressure Relief Valve (PRV)	6 Bar

3-1.4 Accumulator

Electrastream Model	PLUS
Membrane	Butyl for wholesome water
Maximum pressure	7.0 Bar
Minimum pressure	0.8 Bar
Factory set pressure	2 Bar

IMPORTANT
Plastic pipe and fittings should not be used within 1m of the cylinder.

3-1.5 Pipework

All pipes should be sized to suit application.

Suitable types:-

Copper Pipe	EN1057 Kite marked
Plastic Pipe	BS 7291 Kite marked WRAS approved
Soldered copper fittings	EN 1254-1 BS864 Part 2 WRAS approved
Compression type fittings	EN 1254-2 WRAS approved
Push fit fittings	BS7291 pt1/pt2 WRAS approved must be specified as suitable for sealed systems.

3-1.6 Electrics

The Electrastream system must not be installed in any enclosed space where the air temperature could exceed the maximum electrical design ambient of 30°C.

Adequate ventilation should be provided for airing cupboards and enclosed compartments.

Humidity may also present a problem within airing cupboards.

IMPORTANT
Using incorrect cable size will invalidate warranty.

ELECTRASTREAM		
Supply		230V ±10% Single Phase
Fuse		40 amp
RCD		63 amp
Supply Cable Size		6242Y 10mm² Twin & Earth HEAT RESISTANT To latest version of BS6004
Indirect Cylinder		**Single and Twin Coil**
Tri-core Heater Type		Titanium Element EN60335/2/73.96+corr EN 603351.94A11/A15+A1
Tri-core Heater Size		3qty x 3kW (nom 240V)
Tri-core Heater Length		400mm nominal
Fuse Rating*		3qty 16 amp
Cable Size (Control Unit to Elements)		3qty 3183TQ 2.5mm² 3-core round flex HEAT RESISTANT To latest version of BS6500
Heating Controls		
Pump, Room Stat and Motorised Valve	Fuse Rating*	5 amp
	Cable Size	3183TQ 1.5mm² 3-core round flex HEAT RESISTANT To latest version of BS6500
Control Unit to Over Temperature cut-out	Cable Size	3183TQ 0.75mm² 2-core round flex HEAT RESISTANT To latest version of BS6500

*In Electrastream Control Unit

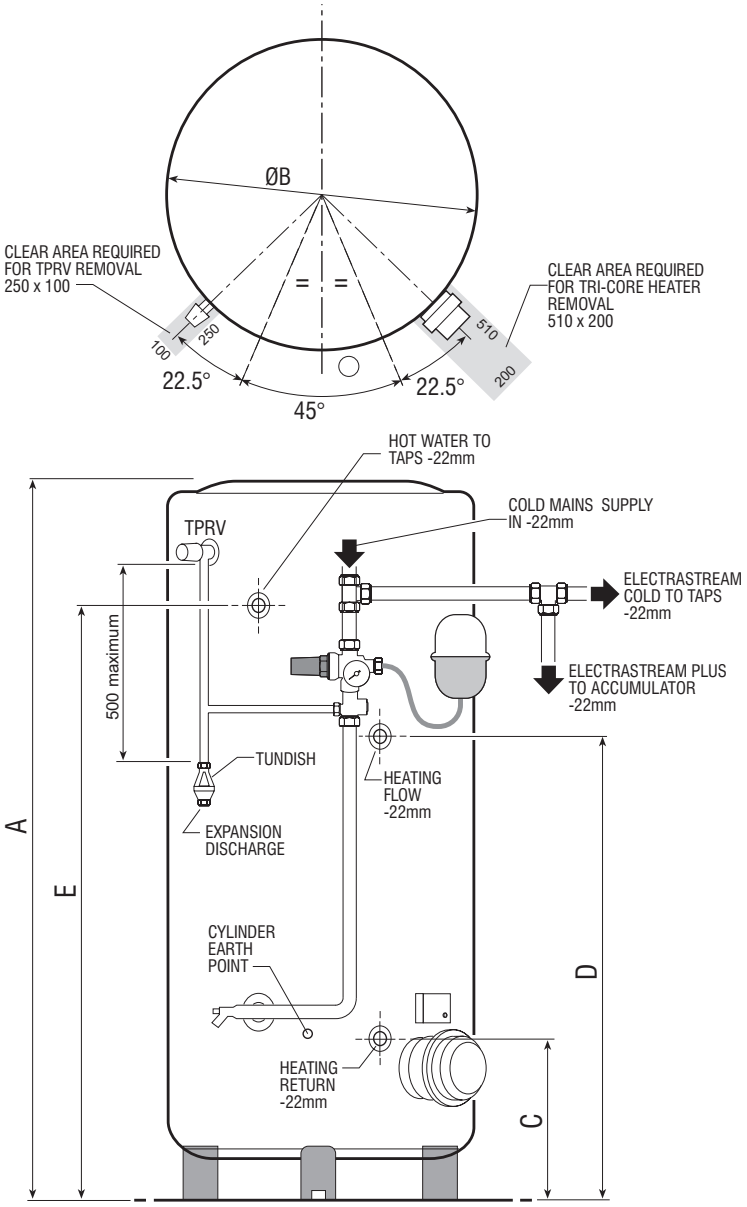
3-2 Dimensions

3-2.1 Cylinder Dimensions - Single Coil

COMPRESSION FITTINGS ARE SUPPLIED TO ADAPT THE CYLINDER TAPPINGS TO THE PIPE SIZES SHOWN.

Note

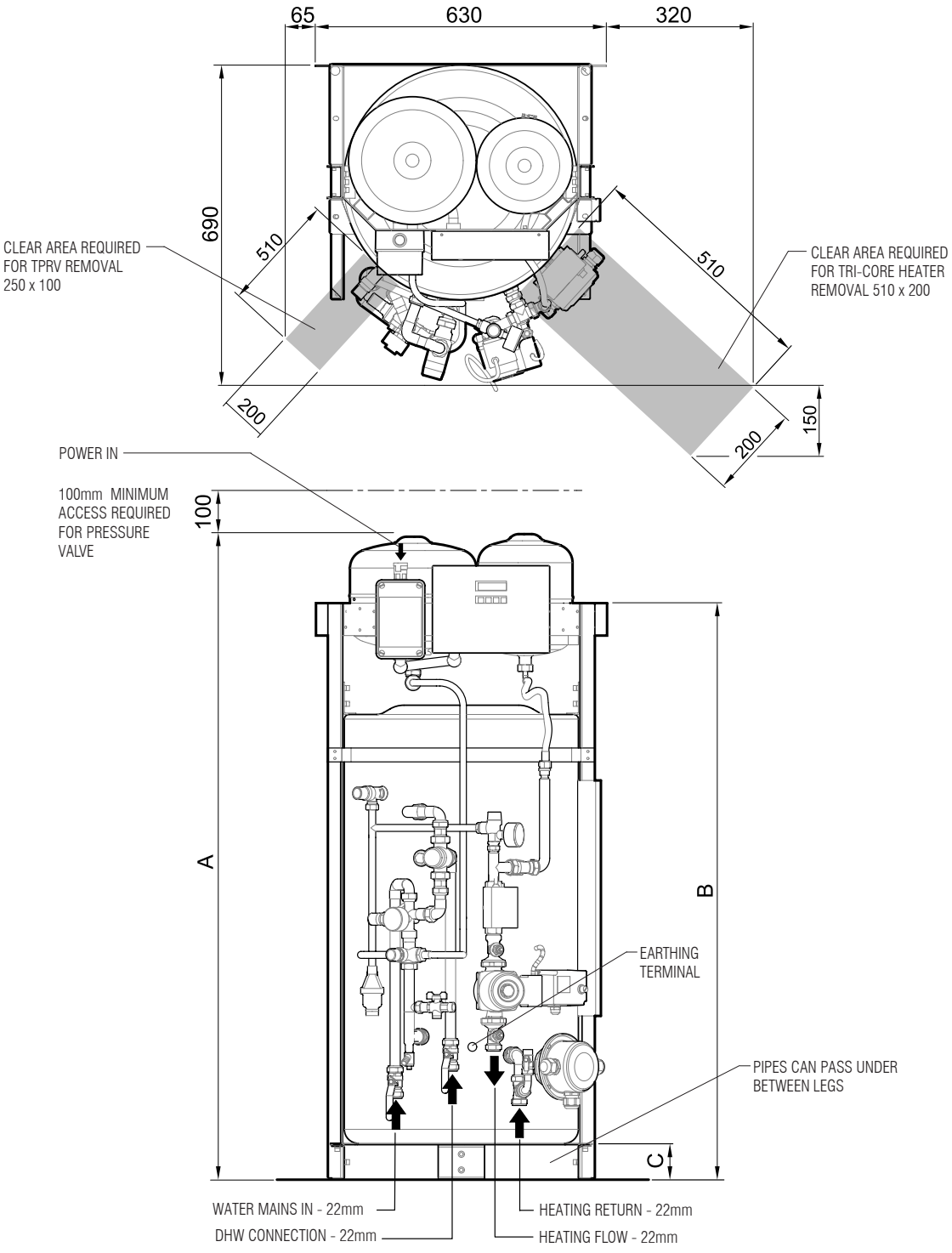
Allow sufficient access for cylinder servicing and replacement. Recommended at least 100mm clearance all round and above.



Cylinder Model	Capacity	Coil Surface	Coil Rating	A	ØB	C	D	E	Weight Empty	Weight Full
BEL125	125 litres	0.67m²	20.5kW	1015	Ø505	225	625	747	25kg	150kg
BEL150	150 litres	0.78m²	26.7kW	1165	Ø505	225	765	905	30kg	180kg

Fig. 3-2a Single Coil Cylinder Dimensions

3-2.2 Pre-plumbed System Dimensions



Part No.	Model	Cylinder Size	A	B	C	Weight Empty	Weight Full
BEP 125	125 Short	125 litres	1392mm	1243mm	78mm	66kg	191kg
BEP 150	150 Short	150 litres	1692mm	1543mm	78mm	71kg	221kg
BEP 125R	125 Long	125 litres	1692mm	1543mm	328mm	72kg	197kg

Fig. 3-2b Single Coil Pre-Plumbed Dimensions

3-2.3 Pre-plumbed Twin Coil BETP210 System Dimensions

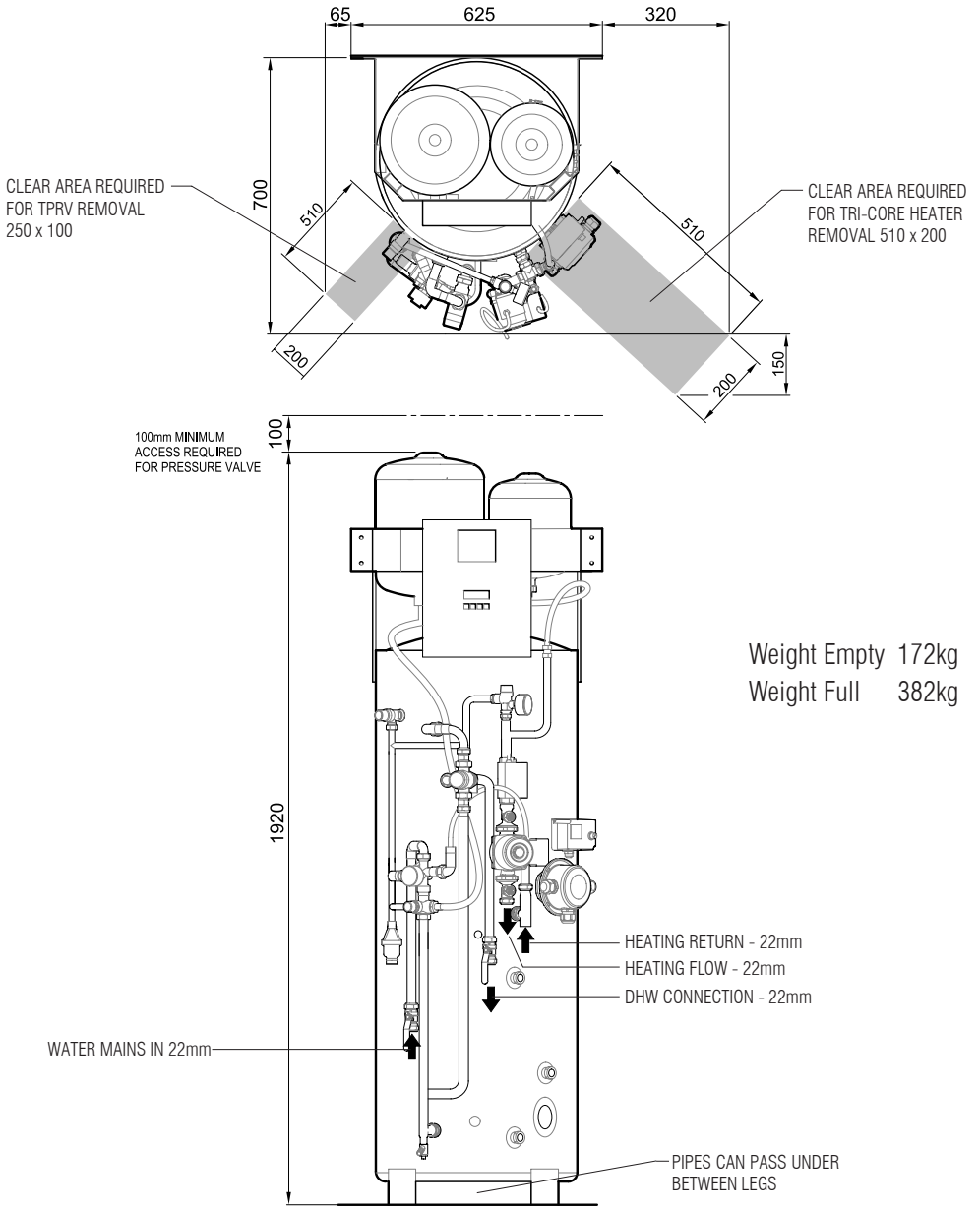
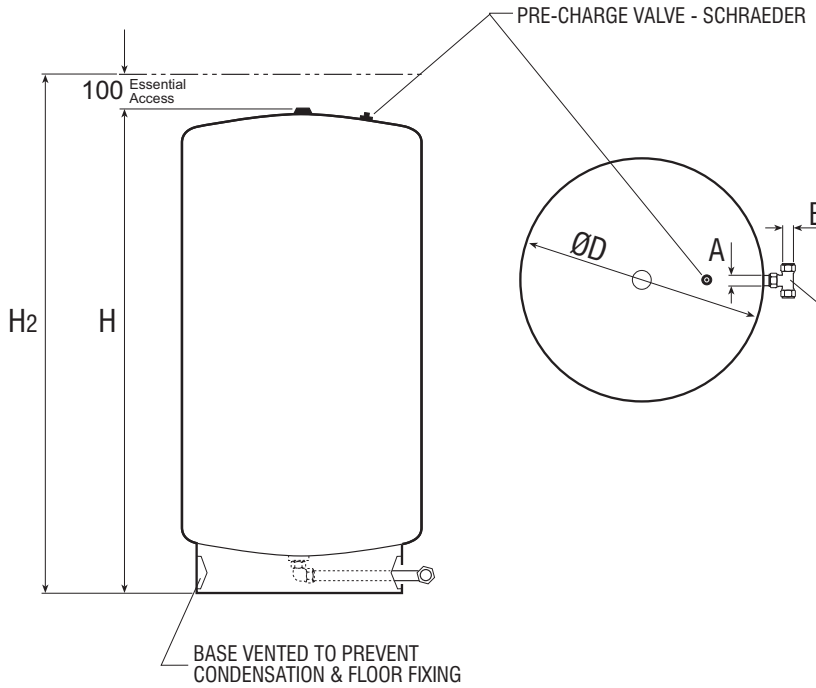


Fig. 3-2c Twin Coil BETP210 Pre-Plumbed Dimensions

3-2.4 Accumulator Dimensions



SIZE OF MAIN	A	B
28mm	28mm	28mm
22mm	28mm	22mm
15mm	28mm	15mm

Accumulator Model	Size (Gross Capacity)	*Maximum Water Content	ØD	H	H2 Recommended minimum space required	Weight Empty	Weight Full @ 65% volume
200	170	up to 110 litres	535mm	940mm	1040mm	30.4kg	141kg
300	310	up to 198 litres	535mm	1500mm	1600mm	44.5kg	232kg

* Water content is up to 65% of the Accumulator gross volume dependent on mains pressure.
Total weight = weight empty + water content @ 1kg/litre.

Fig. 3-2d Accumulator Dimensions

3-2.5 Electrastream Control Unit Dimensions

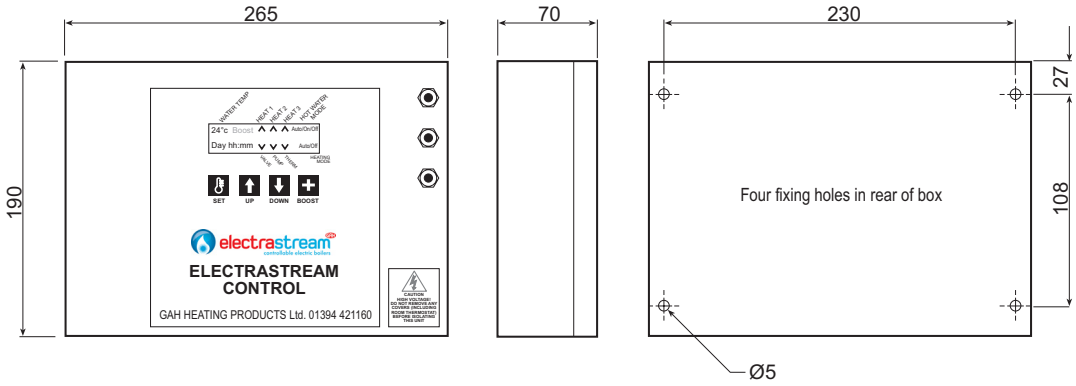


Fig. 3-2e Control Unit Dimensions

3-3 Wiring

3-3.1 Wiring Diagram

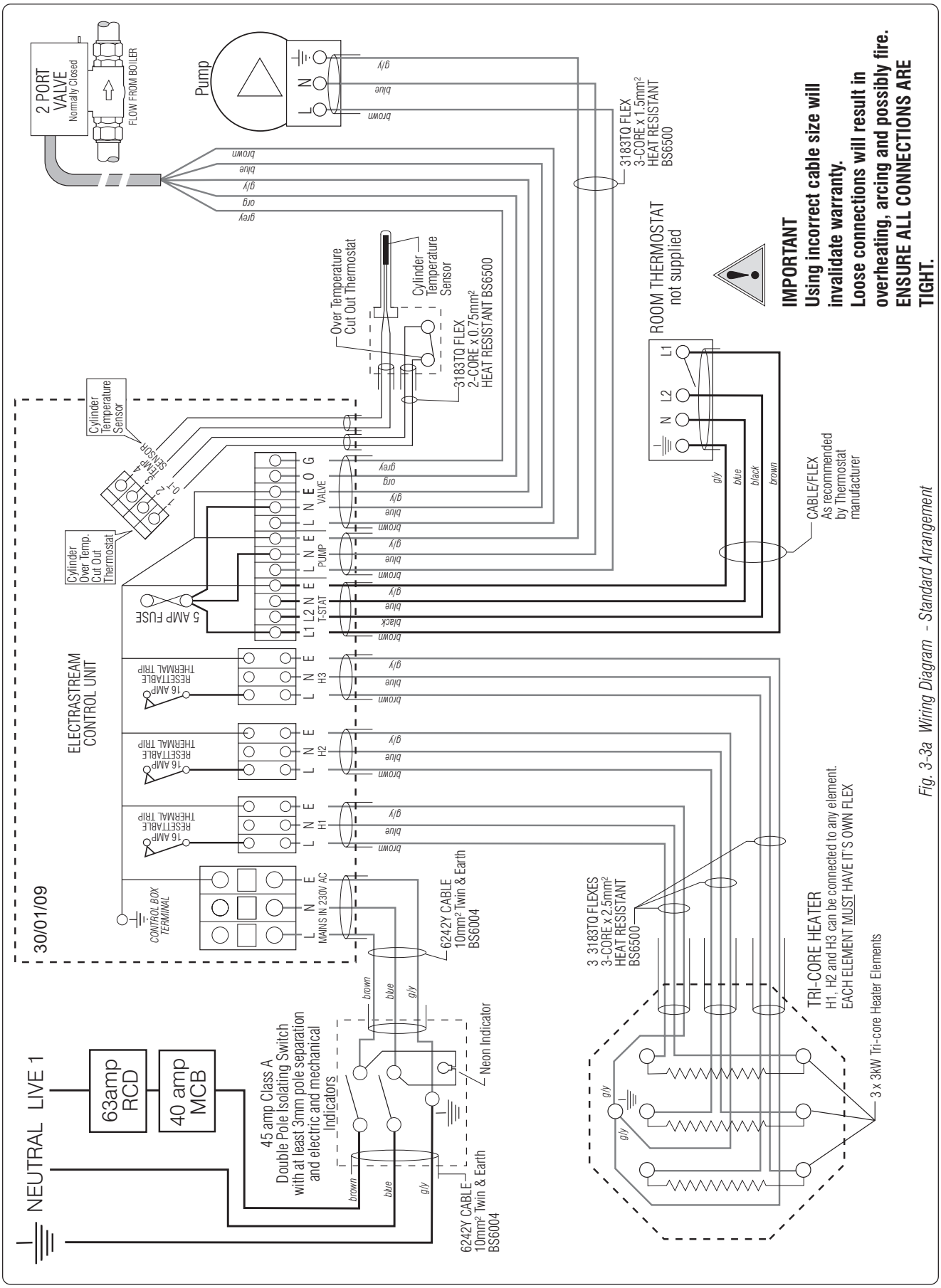

2 PORT VALVE
Normally Closed
FLOW FROM BOILER
Pump
3183TQ FLEX 3-CORE x 1.5mm² HEAT RESISTANT BS6500
ROOM THERMOSTAT not supplied
IMPORTANT
Using incorrect cable size will invalidate warranty.
Loose connections will result in overheating, arcing and possibly fire.
ENSURE ALL CONNECTIONS ARE TIGHT.
Over Temperature Cut Out Thermostat
Cylinder Temperature Sensor
3183TQ FLEX 2-CORE x 0.75mm² HEAT RESISTANT BS6500
CABLE/FLEX As recommended by Thermostat manufacturer
ELECTRASTREAM CONTROL UNIT
30/01/09
5 AMP FUSE
16 AMP RESETTABLE THERMAL TRIP
CONTROL BOX TERMINAL
MAINS IN 230V AC
6242Y CABLE 10mm² Twin & Earth BS6004
3 3183TQ FLEXES 3-CORE x 2.5mm² HEAT RESISTANT BS6500
TRI-CORE HEATER
H1, H2 and H3 can be connected to any element.
EACH ELEMENT MUST HAVE IT'S OWN FLEX
3 x 3kW Tri-core Heater Elements
NEUTRAL LIVE 1
63amp RCD
40 amp MCB
45 amp Class A Double Pole Isolating Switch with at least 3mm pole separation and electric and mechanical Indicators
Neon Indicator

Fig. 3-3a Wiring Diagram - Standard Arrangement

3-3.2 Typical Power Supply

Fig. 3-3b shows a typical power supply for economy meters.

Consult electricity supply company for specific requirements.

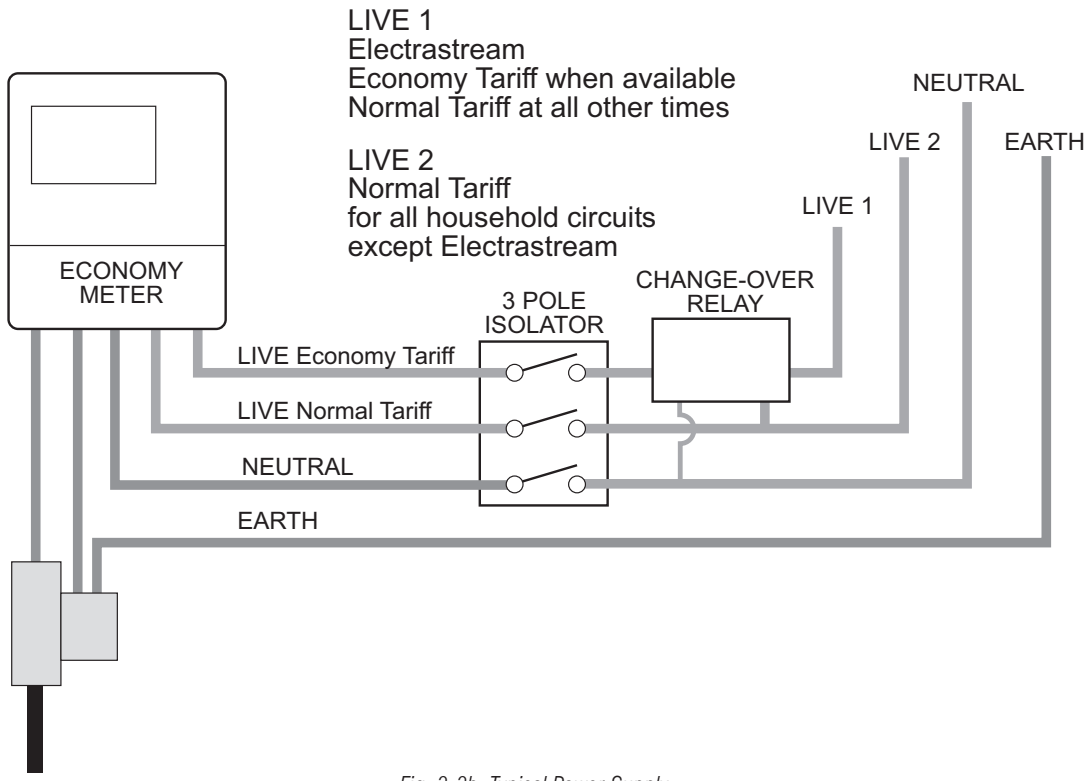


Fig. 3-3b Typical Power Supply

4-1 Building Control

Note
In some areas it is a criminal offence to install an unvented hot water storage system without notifying the local authority, or without the relevant licence.

4-1.1 Water System

To install an Electrastream Heating System the installer must be fully competent, suitably qualified and hold a relevant unvented certificate and any applicable licence that may be required by the local inspectorate for installation of an unvented hot water storage system.

In some areas the Local Authority may require notification by means of a building notice or by the submission of full plans for the proposed installation of an unvented hot water storage system.

4-1.2 Water Regulations

The **Water Bye-laws** and **Current Building Regulations** (paying particular attention to G3 and Part L 1 & 2) and **HSE** requirements should be considered when installing an Electrastream System.

4-2 Electrical

4-2.1 Electrical Regulations

All wiring should be carried out to and comply with the current IEE Wiring Regulations.

All electrical work must comply with any relevant regulations that apply at the time of the installation.

All cables should be to the latest BS6004 specification.

All flexes should be to the latest BS6500 specification.

All cables and flexes must be of correct size as stated on the wiring diagrams.

IMPORTANT
Using incorrect cable size will invalidate warranty.
Loose connections will result in overheating, arcing and possibly fire.
ENSURE ALL CONNECTIONS ARE TIGHT.

Note
The Electrastream MCB may require a ventilation space between it and other MCBs within the consumer unit.

4-2.2 Electrical Work

All electrical installation and maintenance of the Electrastream must be carried out by a competent qualified installer.

All electrical work must be installed to the requirements of this 'User and Installation Manual'.

IMPORTANT
No electrical components, switches or junction boxes should be positioned near or under the Tundish.

4-2.3 Electrical Supply

The main incoming electrical supply to the property should be of adequate voltage, current and temperature rating for the requirements of the Electrastream as well as all other electrical requirements within the property.

The electrical supply to which the Electrastream is connected must be protected by a 63 amp RCD.

The Electrastream must have a dedicated 40 amp MCB.

The Electrastream must be wired through a 40A class A, double pole isolating switch with at least 3mm pole separation, this switch should also have both electric and mechanical indicators. The switch should be located near to the Electrastream control unit.

4-2.4 Off-Peak Electrical Supply

Note
One supplier of Economy 18 is :-
E.On Energy - tel: 0845 0520000

To achieve the most efficient performance from the Electrastream it is strongly recommended to use an **'Economy 18'** Off-Peak electrical supply. Other Off-Peak options such as 'Economy 7' or 'Economy 10' tariffs are also available from most UK electrical suppliers.

Consult the local electricity suppliers to determine what economy tariff options are available before installing the Electrastream.

4-2.5 Electric Cables

All cables must be correctly sized to the requirements stated in the wiring diagrams, failure to do so will invalidate warranty. - see figs. 3-3a and 3-3b.

All cables must be to the latest version of BS6004.

Heat resistant cables MUST be used where specified. GAH recommend all cables have a minimum temperature rating of 80°C

Cables should be routed to ensure they do not come into contact with hot surfaces or pipes on the Electrastream system. The use of pipe insulation is recommended where contact between pipes and cables is possible.

When extending existing cables (flying leads), use suitable rated cables and ensure they are correctly jointed, sleeved and covered.

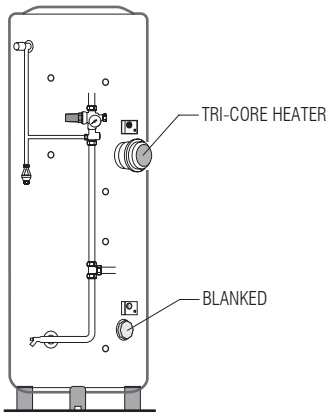


Fig 4-2a Twin Coil Cylinder

4-2.6 Tri-core Heater

The H1, H2 and H3 connections on the Electrastream control unit can be connected to any of the three heater elements, however each element MUST be wired independently with a separate 3 core 2.5mm^2 heat resistant cable.

All three earth cables must be connected to the dedicated earth terminal within the tri-core heater's cover.

Twin coil cylinders have two immersion heater tappings. The Electrastream tri-core heater must always be fitted to the upper tapping.

The cylinder is supplied with the lower immersion heater tapping blanked off. No immersion heater should be fitted.

4-3 Hot Water System

Note

The Electrastream system must not be installed in any enclosed space where the air temperature could exceed the maximum electrical design ambient of 30°C.
Adequate ventilation should be provided for airing cupboards and enclosed compartments.
Humidity may also present a problem within airing cupboards.

4-3.1 Unvented Hot Water Cylinder

The cylinder may be installed at any convenient above ground location within the property. As Electrastream is a sealed system, the cylinder is equally effective on any floor.

The cylinder must always be installed vertically.

Avoid positioning the cylinder where it may be subjected to frost.

The floor must give adequate support to the filled cylinder.

Cylinders must have frost protection when they are installed where low temperatures could be a potential problem - see 1-4.8.

Cylinders with legs are supplied with self-tapping screws for floor fixing.

For servicing and cylinder replacement, clearance is required all round the cylinder - recommended 100mm minimum.

The cylinder must be fitted with a drain valve, this should be as low as possible and able to drain at least 80% of the cylinder's volume.

The cylinder may be installed below ground i.e. in a basement, providing that the expansion relief discharge pipe is plumbed to a metal receptacle with a suitable pump and switch arrangement, current Building Regulations give details of this. An alternative is to use a Hepworth HepvO Self Sealing Waste Valve, this must be installed to the manufacturers specification and building regulations.

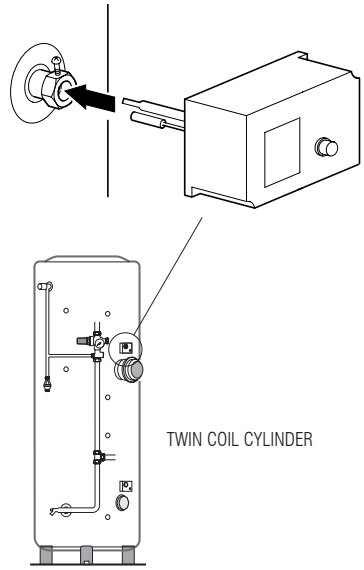


Fig. 4-3a Cylinder Temperature & Over Temperature Cut-Out Box

4-3.2 Cylinder Temperature Sensor & Over Temperature Cut-Out Box

The cylinder temperature sensor and over temperature cut-out box is an integral part of the Electrastream control system. The Electrastream must not be switched on if the box is not fitted.

The unit consists of a temperature sensor and over temperature cut-out device, both are wired back to the Electrastream control unit - see wiring diagrams figs. 3-3a and 3-3b.

The box must be fitted to the cylinder with its phial and sensor inserted into the socket provided (located above the tri-core heater). A screw is provided to clamp it securely in place.

The box is supplied pre-wired. If the cables need to be extended use suitable rated cables and ensure they are correctly jointed, sleeved and covered.

Note

For wiring see figs. 3-3a and 3-3b.

4-3.3 Combination Valve

Refer to figs. 4-3b and 4-3c.

The Combination Valve is supplied separate, it has to be fitted to the pipework supplying the cylinder.

For standard configurations see figs. 1-2a and 1-2b.

The valve has an integral 3.5 Bar Pressure Reducing Valve and a 6 Bar Expansion Relief Valve. It also has an in-line strainer, this should be checked as part of routine inspection.

No shut off or isolation valves should be fitted between the combination valve and the cylinder.

4-3.4 Hot Water Expansion Vessel

An Expansion Vessel is supplied for the hot water system, this should be fitted to the combination valve which has a ¾" BSP port provided for this. The expansion vessel must always be open to the system with NO shut off or isolation valves in the connection pipe.

Clearance is required on top of the vessel to access the pressure valve.

It is the responsibility of the installer to set the correct pre-charge pressure of the vessel.

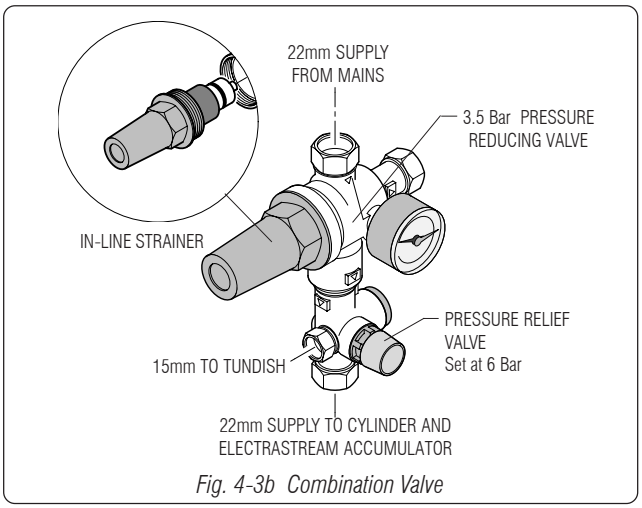

22mm SUPPLY FROM MAINS
3.5 Bar PRESSURE REDUCING VALVE
IN-LINE STRAINER
PRESSURE RELIEF VALVE Set at 6 Bar
15mm TO TUNDISH
22mm SUPPLY TO CYLINDER AND ELECTRASTREAM ACCUMULATOR

Fig. 4-3b Combination Valve

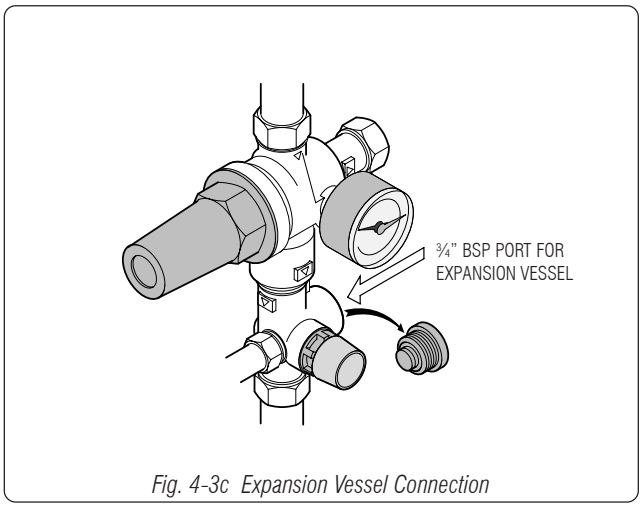


Fig. 4-3c Expansion Vessel Connection

4-3.5 Accumulator (Electrastream Plus only)

The accumulator may be installed at any convenient location within the property, outhouse, garage, loft or basement. For optimum efficiency this should be fitted furthest from the incoming mains supply.

The accumulator should be installed vertically.

The floor must give adequate support to the filled accumulator.

Note
As Electrastream Plus is a sealed system, the pressure at the taps is not affected by the height of the cold water storage.

Accumulators must have frost protection when they are installed where low temperatures could be a potential problem - see 1-4.7.

Note that space is required to the top of the vessel to access the pressure valve.

Provision must be made to enable the accumulator to be drained when required.

IMPORTANT The accumulator is supplied at 2 Bar pressure. It is recommended to set the pressure at 1.5 Bar below the mains pressure with a minimum of 0.8 Bar - see 5-1.2.

4-3.6 Scale Protection

IMPORTANT All installations should have a scale protection device fitted and in areas known to have hard water, a water softening device is strongly recommended. The cylinder is not guaranteed against damage caused by scale. Higher water temperatures of 65°C and above can cause excessive scale.

GAH offer a range of quality Water Softeners, for information contact GAH (HEATING PRODUCTS) LTD.

GAH recommend and promote the use of scale prevention devices and water softeners in areas that are known to have hard water. Installed correctly they prolong the life of equipment and help prevent limescale formation in the pipework. Water Softeners provide the advantages of soft water, as well as preventing scale build up on taps and shower heads.

Water softeners and any mains fed system must be of adequate capacity and should be installed with suitably sized hoses to prevent any possibility of flow reduction.

The location and position of the Scale Protection Device or Water Softener should be as the manufacturers recommendations.

4-3.7 Pipework

When all pipework has been installed, disconnect from the Electrastream components and flush all pipework thoroughly.

When connecting to existing pipework remove all unwanted components, create new pipe runs then flush thoroughly before connecting to the Electrastream components.

4-3.8 Electrastream Components

All Electrastream components and pipework are checked at the factory prior to dispatch, however always check the connections for leaks on commissioning as transportation and installation can cause joints to move.

IMPORTANT
Under no circumstances should the system be operated without the cylinder TPRV fitted and working correctly. The cylinder tapping for the TPRV must not be used for any other purpose.

4-3.9 Hot Water TPRV

The temperature and pressure regulating valve (TPRV) fitted to the cylinder is to protect the cylinder from overheating and/or over pressure.

The TPRV discharge must comply with Building Regulations G3 refer to pages 40-42.

The valve will open if the system hot water pressure exceeds 7 Bar ± 10%.

The valve will open if the system hot water temperature exceeds 90 to 95°C.

The valve can be manually opened by turning the green knob clockwise, to close continue turning clockwise until it clicks.

4-3.10 Thermostatic Mixing Valve

A Thermostatic Mixing Valve is supplied with the Electrastream. It should be fitted between the cylinder hot water outlet and the draw off (taps). The valve mixes hot water from the cylinder with cold water to provide hot water at the taps at a consistent temperature.

The valve is supplied with two check valves which must be fitted to the hot and cold supply.

It is recommended to fit a full bore service valve on each of the three pipes to the valve.

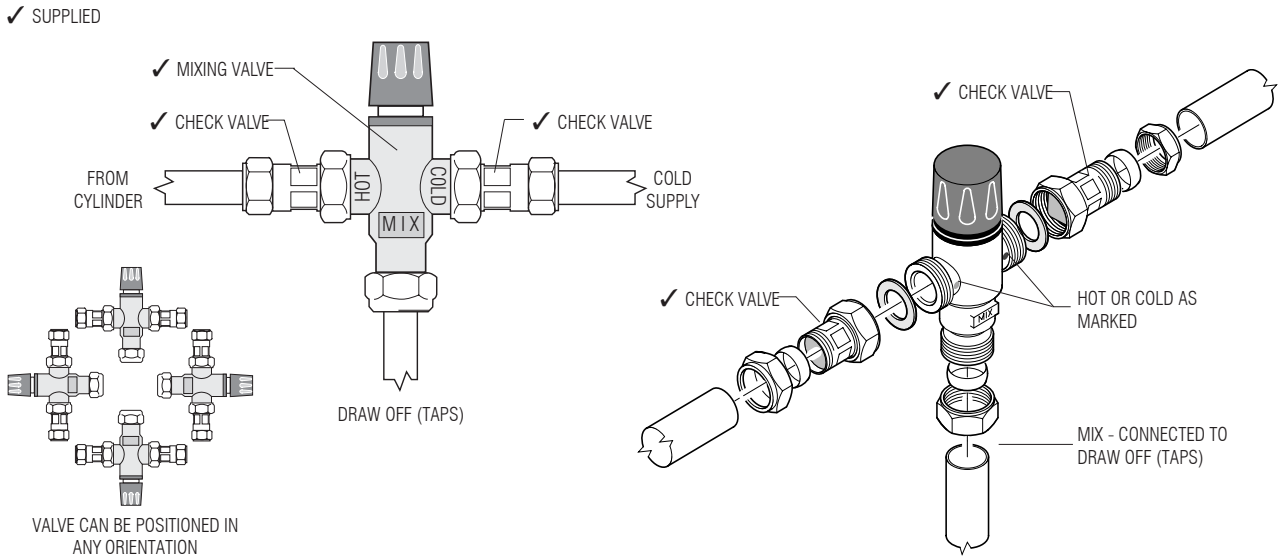


Fig. 4-3d Thermostatic Mixing Valve

Notes

Refer to the mixing valve manufacturer's instructions supplied with the valve for further information. Put these with this manual.

The mixing valve is not guaranteed against corrosion or blockage caused by excessive scale - see 4-3.5.

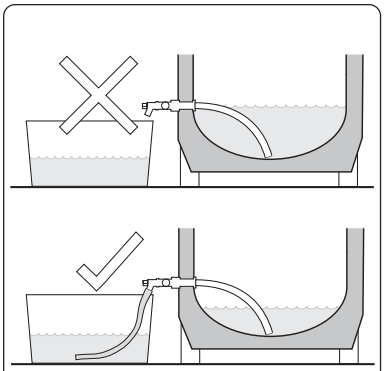


Fig. 4-3e Cylinder Drain

4-3.11 Cylinder Drain

See fig. 4-3.e.

The unvented cylinder cold feed is also used as the cylinder drain. Inside the cylinder a syphon pipe is fitted; when a hose is used to drain the cylinder a syphon action will drain maximum water from the cylinder.

Always use a hose for flushing and cleaning the cylinder.

It is not possible to fully drain the cylinder without using a hose.

4-3.12 Secondary Return

A secondary return may be fitted to unvented cylinders (consult the label on the face of the unit for the correct location). A *non-return valve must be fitted to prevent back flow and a *bronze pump will be required in conjunction with a *pipe thermostat and timer to circulate the hot water (*not supplied).

Note

An extra expansion vessel may be required where the additional volume of the secondary return exceeds the capacity of the expansion vessel supplied.

4-4 Heating System

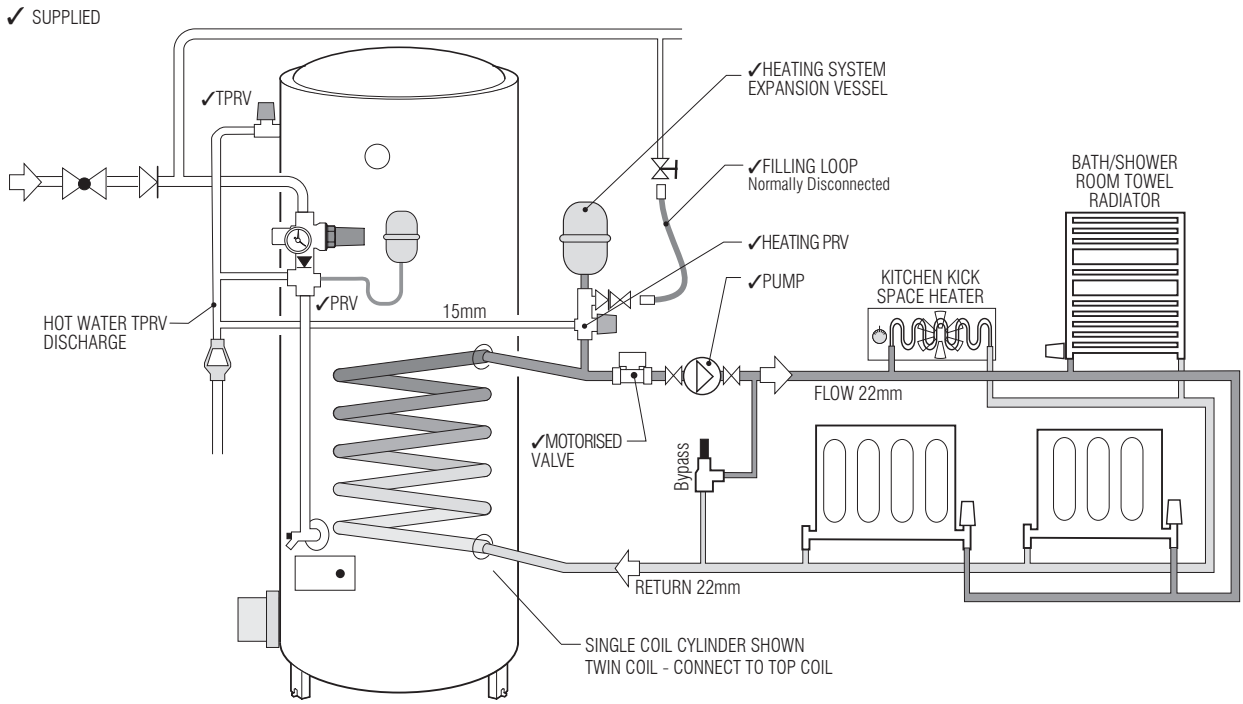


Fig. 4-4a Schematic of Typical Heating System

4-4.1 Notes on Heating System

1. The total output from the Electrastream for hot water and heating is 9 kW @ 240V (30,000 Btu). The radiators should be sized to suit.
2. The schematic system shows a kick space fan assisted heater, these are efficient space saving units, ideal for small dwellings.

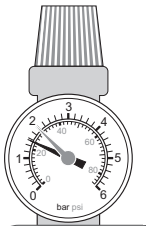


Fig. 4-4b Pressure Gauge

4-4.2 Pressure Gauge

The pressure gauge is provided to indicate the heating system pressure.

When the system is full with cold water and all radiators are full, on and bled/vented, the gauge will show the cold fill pressure.

Set the red pointer to the cold fill pressure. If the system pressure, indicated by the black pointer, falls below the cold fill pressure, it means that the system requires topping up.

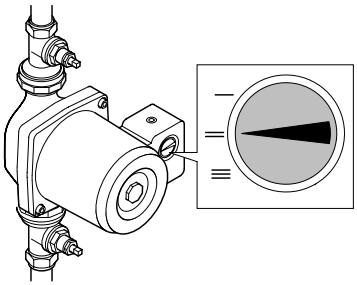


Fig. 4-4c Pump Speed

4-4.3 Pump

Electrastream is supplied with a standard 3 speed central heating circulating pump and isolating valves. This should be fitted in the flow from the indirect cylinder before the bypass valve.

Normally the pump will be set at speed 2 (II).

The pump is wired so that it is ON when the heating control system is set for heating ON and the room thermostat is set higher than the ambient temperature - see wiring diagrams figs. 3-3a and 3-3b.

4-4.4 Heating PRV

The pressure relief valve (PRV) is provided to vent excess pressure from the system. The valve will open when the pressure exceeds 3 Bar ± 10%.

The valve can be manually opened by turning the red knob clockwise, to close the valve continue turning clockwise until it clicks.

Note

One Tundish is supplied with the Electrastream, this should be fitted to the hot water TPRV and heating PRV discharge, see fig. 4-4a.

IMPORTANT Under no circumstances should the system be operated without the heating PRV fitted and working correctly.

4-4.5 Heating PRV Discharge Pipe

The outlet from the heating PRV must be piped using 15mm copper pipe to the tundish then to a visible position outside the dwelling. The pipe must have a continuous fall and ideally be terminated over a drain.

The heating PRV may be plumbed to the hot water system TPRV discharge prior to the Tundish, see fig. 4-4a.

The PRV discharge must comply with Building Regulations G3 refer to pages 40-42.

IMPORTANT Scalding water and steam can be emitted from the discharge pipe. Position the discharge so there is no hazard to property or people (especially children).

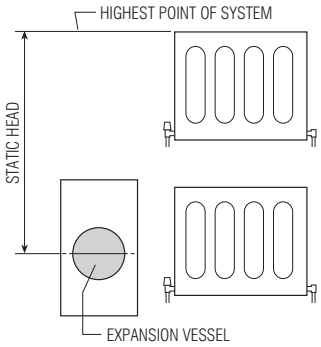


Fig. 4-4d Static Head

Note

Normally expansion requirement is 4% of the system water content including the unvented cylinder coil.

4-4.6 Heating System Expansion Vessel (red)

Maximum charge pressure	1.5 Bar	Maximum working temperature	90°C
Pre-charge pressure	1 Bar	Maximum working pressure	3 Bar
Capacity	8 litres	for maximum system expansion of 7 litres.	

An expansion vessel and mounting kit is supplied, this is suitable for systems with a static head of up to 5 metres. If the static head is greater than 5 metres the charge pressure of the expansion vessel will need to be increased. Increase the pressure using a standard car tyre pump and pressure gauge when the system is empty (zero pressure).

Expansion vessels are suitable for systems requiring a maximum expansion of 7 litres as detailed above. For systems requiring more expansion a second expansion vessel will be required. BS7074 Part 1 includes information on this requirement.

Clearance is required on top of the vessel to access the pressure valve.

4-4.7 Filling Loop

A Filling Loop comprising a flexible hose, double check valve and an isolating valve is supplied for filling and topping up the system.

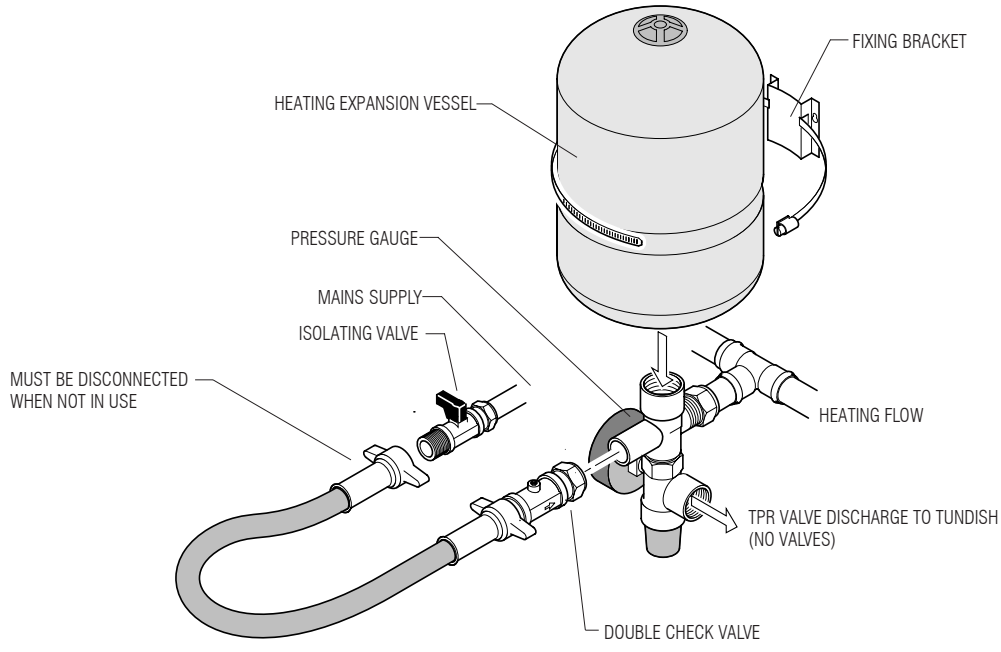


Fig. 4-4e Heating Expansion Vessel, TPR Valve and Filling Loop

The filling loop should be fitted between the incoming mains and the heating system return as shown in figs. 1-2a, 1-2b and 4-4a. Locating the filling loop within site of the pressure gauge is recommended, however if this is not practical an extra gauge can be fitted adjacent to the filling loop.

When not in use one of the hose unions must be disconnected as there must not be a permanent connection to the mains supply.

4-4.8 Motorized Valve

A 2 port motorised valve is supplied, this should be fitted in the heating flow from the cylinder directly after the heating PRV take off and prior to any other take-offs. The valve is wired as shown in figs. 3-3a and 3-3b.

The valve is normally closed to prevent gravity feed from the cylinder to the heating system, when the pump starts the valve opens.

4-4.9 Bypass (not supplied)

An automatic bypass valve should be fitted between the flow and return of the heating system, normally after the pump but before any radiator take offs. The valve must be set to suit the pressure of the system, refer to manufacturers instructions.

IMPORTANT
When a programmable room thermostat is used it should only be set to call for heat when 'Economy Tariff' is available.

4-4.10 Room Thermostat (not supplied)

A standard room thermostat with no built in timers or functions is recommended, e.g. Honeywell T6360B or equivalent.

4-5 Expansion Discharge

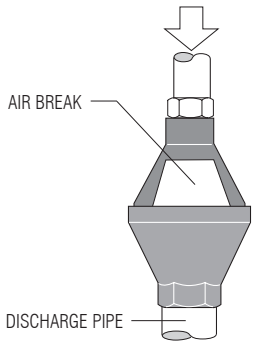


Fig. 4-5a Tundish

4-5.1 Tundish (supplied)

Normally the Electrastream cylinder is supplied with a TPR valve and PR valve (part of the combination valve) fitted and plumbed to the Tundish.

Fig. 4-5b shows typical GAH expansion discharge arrangement for unvented cylinders.

The Tundish must be vertical and fitted within 500mm of the temperature and pressure relief valve and must be located with the cylinder. The tundish must also be in a position visible to the occupants, and positioned away from any electrical devices. The discharge pipe from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, and be made of metal.

The Tundish must not be located near or above electrical components, switches or junction boxes.

4-5.2 Expansion Discharge - Self Sealing Valve

A Hepvo Self Sealing Valve enables alternative discharge arrangements to be used, however its use and installation must be approved by the local building control. Refer to G3 Regulation and valve supplier/manufacturers instructions for installation and servicing requirements.

WARNING
Scalding water and steam can be blown out of the discharge pipe. Position the discharge so that it is not a hazard to property or people (especially children).

4-5.3 Expansion Discharge Pipe - To Gully

The discharge pipe from the Tundish must be installed to comply with Part G3 of the Building Regulations (latest edition). The following text, and diagram 1 are reproduced from G3 Building Regulations 2000 (as amended) Draft.

Discharge pipes from safety devices

Discharge pipe D1

3.49 *Each of the* ***temperature relief valves*** *or* ***combined temperature and pressure relief valves*** *specified in 3.13 or 3.17 should discharge either directly or by way of a manifold via a short length of metal pipe (D1) to a* ***tundish.***

3.50 *The diameter of discharge pipe (D1) should be not less than the nominal outlet size of the* ***temperature relief valve.***

3.51 *Where a manifold is used it should be sized to accept and discharge the total discharge from the discharge pipes connected to it.*

3.52 *Where valves other than the* ***temperature and pressure relief valve*** *from a single unvented hot water system discharge by way of the same manifold that is used by the safety devices, the manifold should be factory fitted as part of the* ***hot water storage system unit*** *or package.*

Tundish

3.53 *The* ***tundish*** *should be vertical, located in the same space as the unvented* ***hot water storage system*** *and be fitted as close as possible to, and lower than, the valve, with no more than 600mm of pipe between the valve outlet and the* ***tundish*** *(see Diagram 1).*

Note: *To comply with the Water Supply (Water Fittings) Regulations, the* ***tundish*** *should incorporate a suitable air gap.*

3.54 *Any discharge should be visible at the* ***tundish****. In addition, where discharges from safety devices may not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.*

Discharge pipe D2

3.55 *The discharge pipe (D2) from the* ***tundish*** *should:*

a. *have a vertical section of pipe at least 300mm long below the* ***tundish*** *before any elbows or bends in the pipework (see Diagram 1); and*

b. *be installed with a continuous fall thereafter of at least 1 in 200.*

3.56 *The discharge pipe (D2) should be made of:*

a. *metal; or*

b. *other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard (e.g.) as specified in the relevant part of BS 7291).*

3.57 *The discharge pipe D2 should be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight*

pipe 9m long, i.e. for discharge pipes between 9m and 18m the equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device; between 18 and 27m at least 3 sizes larger, and so on; bends must be taken into account in calculating the flow resistance. See Diagram 1, Table 1 and the worked example.

Note: *An alternative approach for sizing discharge pipes would be to follow Annex D, section D.2 of BS 6700:2006 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.*

Diagram 1 ***Typical discharge pipe arrangement***

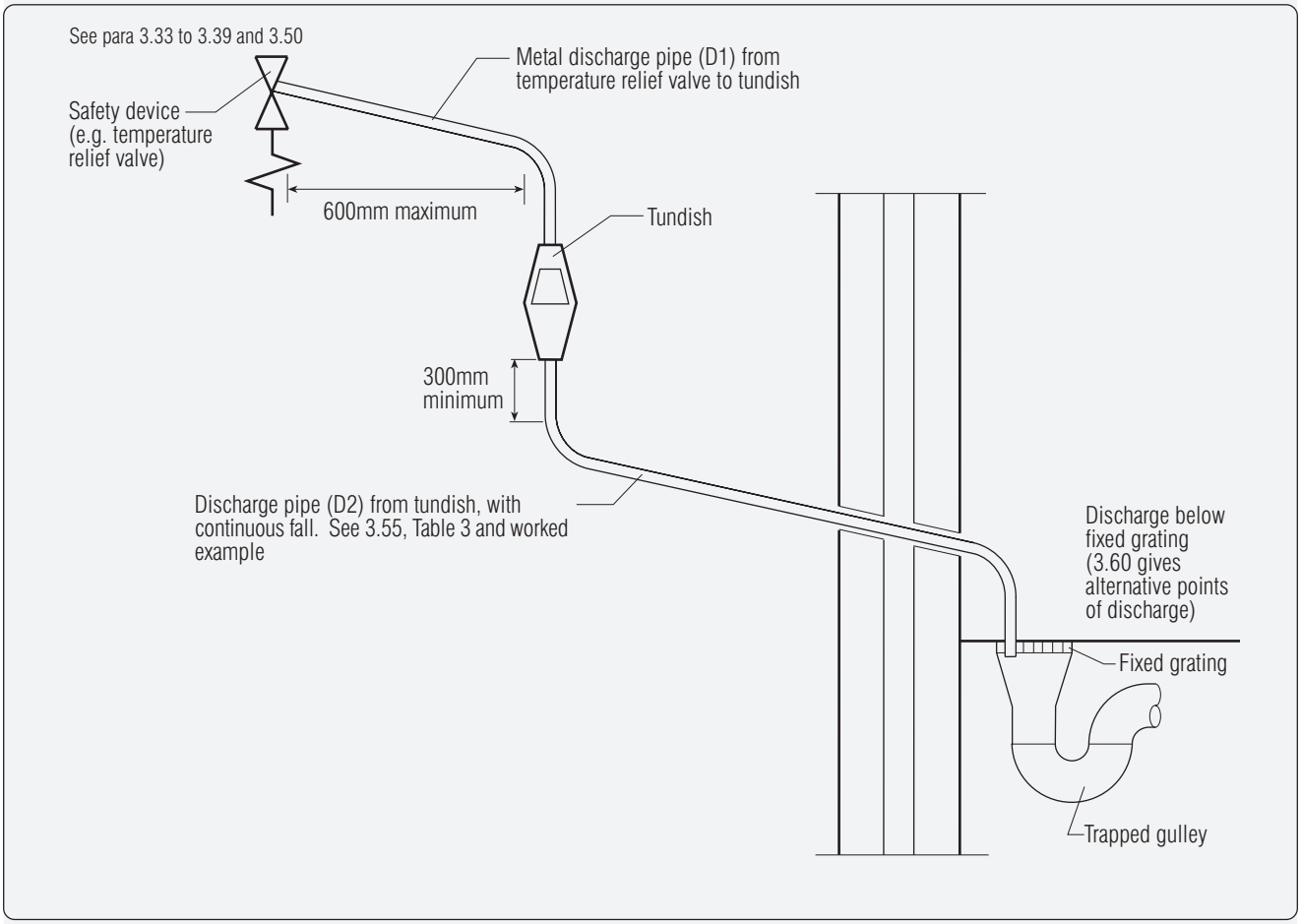

See para 3.33 to 3.39 and 3.50
Safety device (e.g. temperature relief valve)
Metal discharge pipe (D1) from temperature relief valve to tundish
600mm maximum
Tundish
300mm minimum
Discharge pipe (D2) from tundish, with continuous fall. See 3.55, Table 3 and worked example
Discharge below fixed grating (3.60 gives alternative points of discharge)
Fixed grating
Trapped gulley

Table 1 ***Sizing of copper discharge pipe 'D2' for common temperature relief valve outlet sizes***

Valve outlet size	Minimum size of discharge to Tundish (**D1**)*	Minimum size of discharge pipe from Tundish (**D2**)*	Maximum resistance allowed expressed as a length of straight pipe, i.e. no elbows or bends	Resistance created by each elbow or bend
G ½	15 mm	22 mm 28 mm 35 mm	up to 9 m up to 18 m up to 27 m	0.8 m 1.0 m 1.4 m
G ¾	22 mm	28 mm 35 mm 42 mm	up to 9 m up to 18 m up to 27 m	1.0 m 1.4 m 1.7 m
G 1	28 mm	35 mm 42 mm 54 mm	up to 9 m up to 18 m up to 27 m	1.4 m 1.7 m 2.3 m

**See 3.49 and 3.56 and Diagram 1*
Note: *The above table is based on copper tube. Plastic pipes may be of different bore and resistance. Sizes and maximum lengths of plastic should be calculated using data prepared for the type of pipe being used.*

Worked Example

The example below is for a G½ 6 with a discharge pipe (D2) having 4 No. 22mm elbows and length of 7m from the ***tundish*** *to the point of discharge.*

From Table 1:

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G½ ***temperature relief valve*** *is: 9.0m*

Subtract the resistance for 4 No. 22mm elbows at 0.8m each = 3.2m

Therefore the maximum permitted length equates to: 5.8m which is less than the actual length of 7m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28mm copper discharge pipe (D2) from a G½ ***temperature relief valve*** *is: 18m*

Subtract the resistance for 4 No. 28mm elbows at 1.0m each = 4m

Therefore the maximum permitted length equates to: 14m

As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

3.58 *Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.*

3.59 *The discharge pipe should not be connected to a soil discharge stack unless it can be demonstrated that the soil discharge stack is capable of safely withstanding temperatures of the water discharged, in which case, it should:*

a. *contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the* ***tundish****;*

b. *be a separate branch pipe with no* ***sanitary appliances*** *connected to it;*

c. *if plastic pipes are used as branch pipes carrying discharge from a safety device they should be either polybutalene (PB) to Class S of BS 7291-2:2006 or cross linked polyethylene (PE-X) to Class S of BS 7291-3:2006; and*

d. *be continuously marked with a warning that no* ***sanitary appliances*** *should be connected to the pipe.*

4-5.4 GAH Expansion Discharge

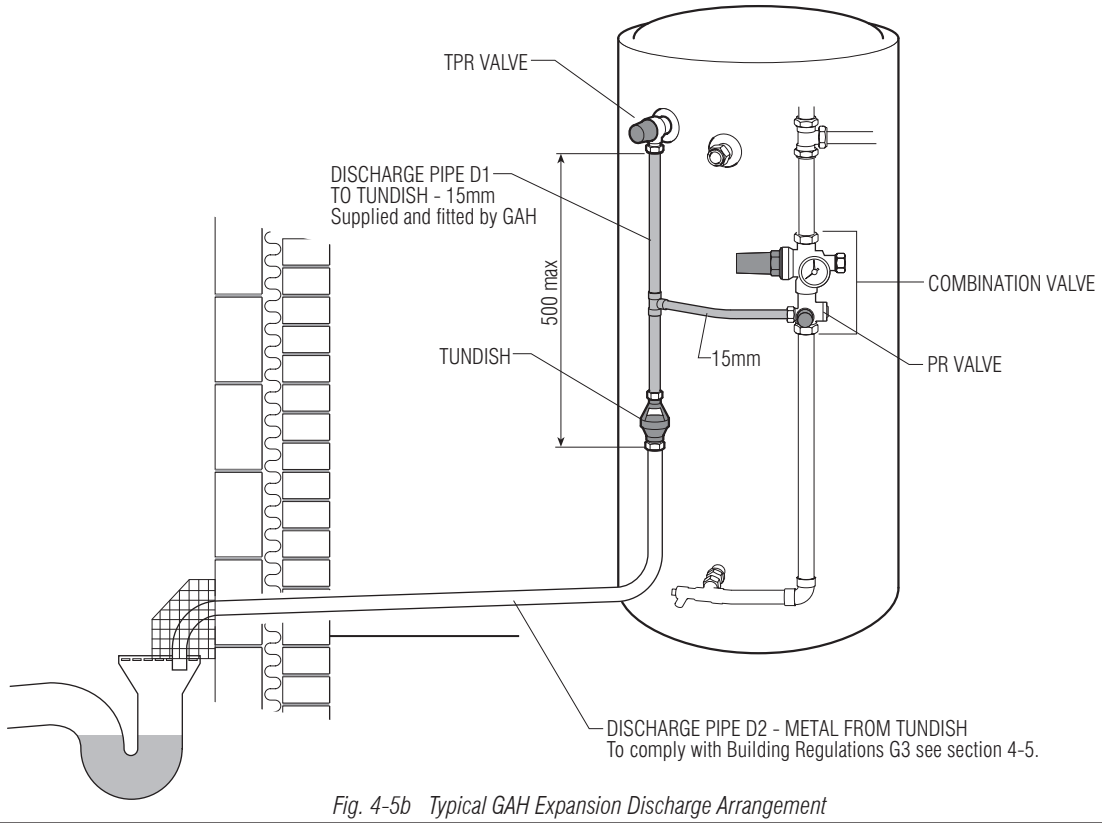


Fig. 4-5b Typical GAH Expansion Discharge Arrangement

4-6 System Pressure

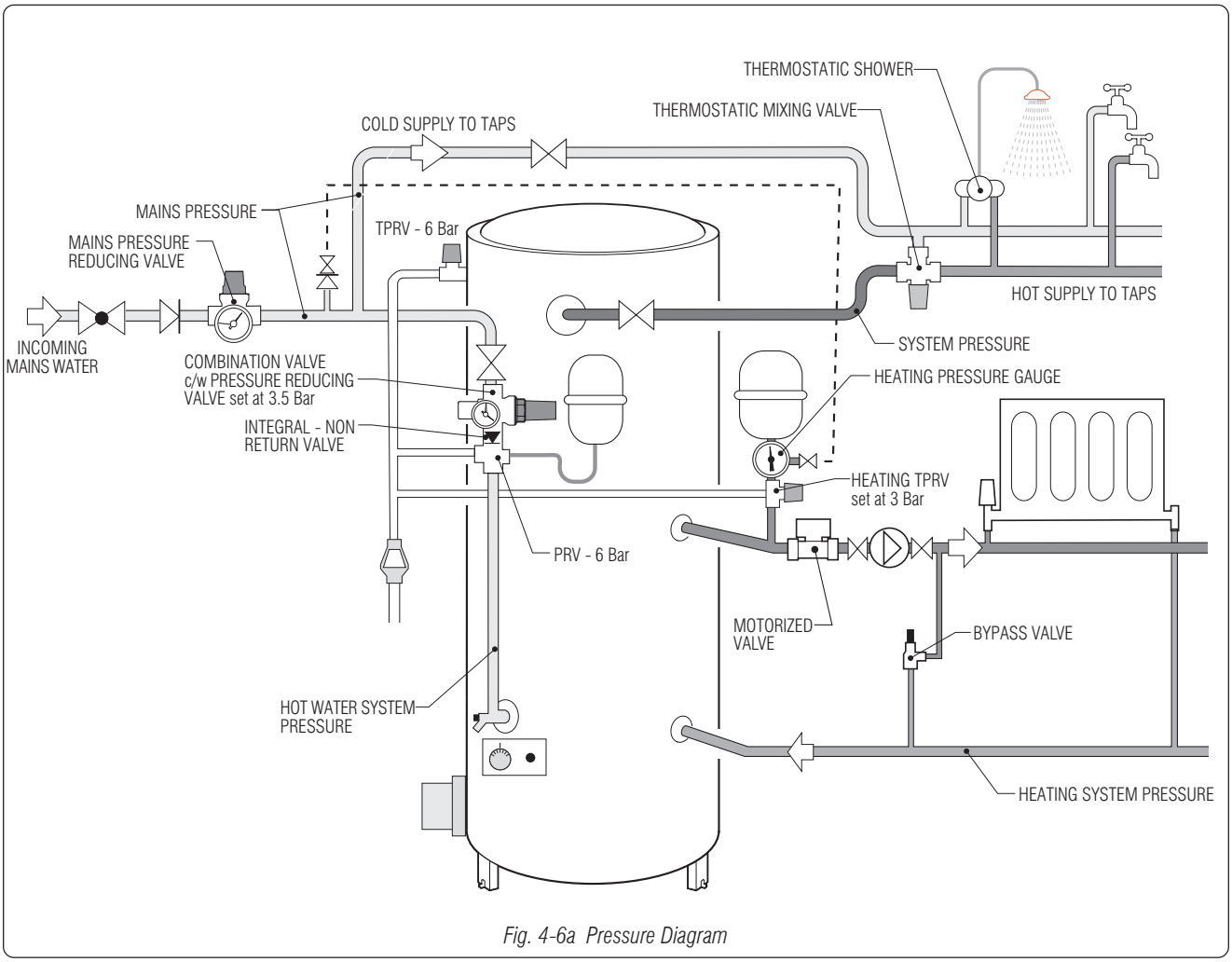


Fig. 4-6a Pressure Diagram

Notes on Pressures:-

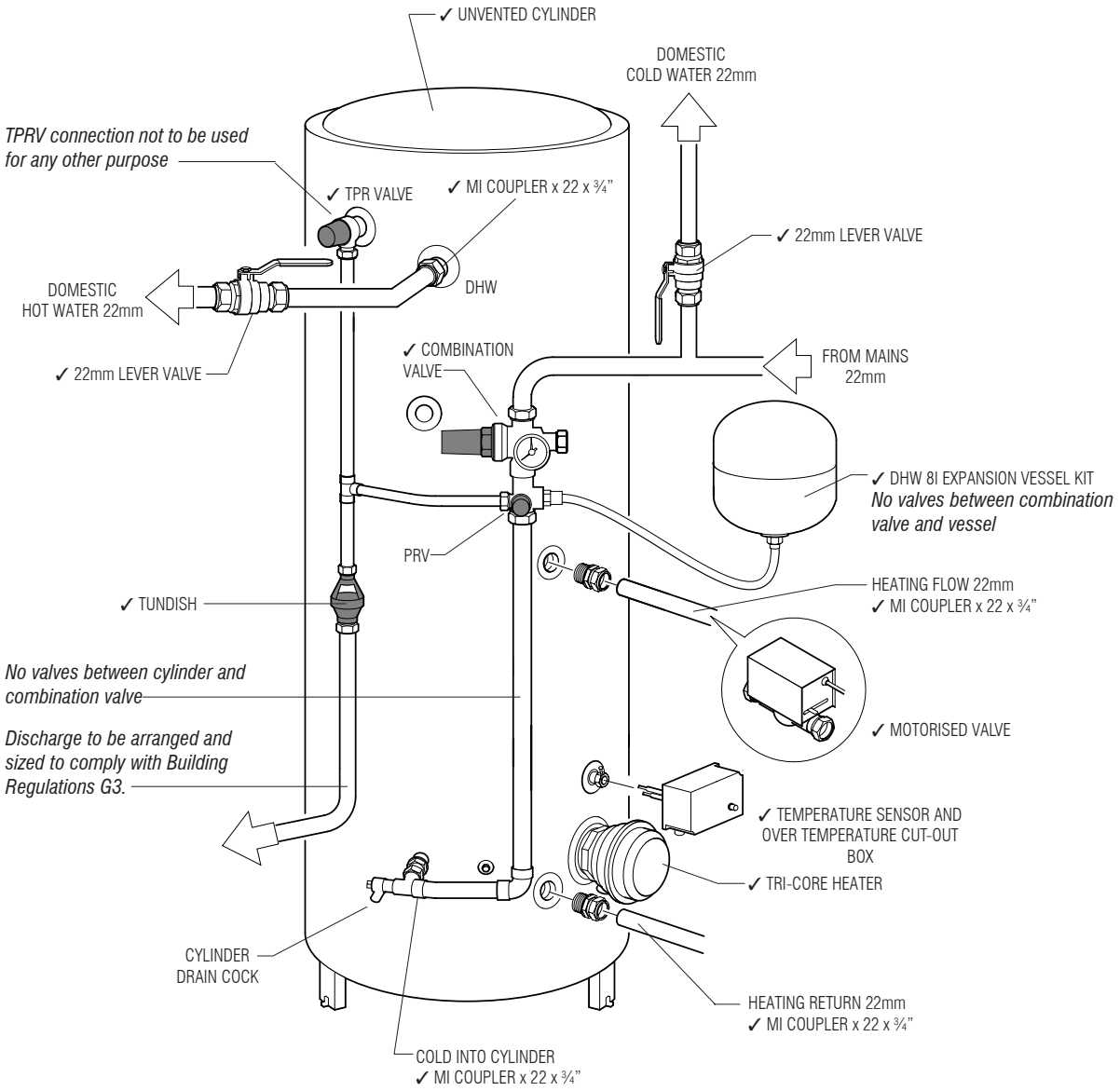
1. The Mains Pressure Reducing Valve is not normally required on standard systems with normal mains pressure, however, if the mains pressure is more or fluctuates above 4 Bar a Mains Pressure Reducing Valve should be considered.
2. The Combination Valve has an integral pressure reducing valve fixed at 3.5 Bar therefore the hot water System Pressure will be 3.5 Bar maximum.
3. If the Mains Pressure is less than 3.5 Bar then the hot water System Pressure will be at maximum Mains Pressure.
4. The Combination Valve has a Pressure Relief Valve (PRV) set at 6 Bar.
5. The unvented cylinder has a Temperature and Pressure Relief Valve (TPRV) set at 7 Bar.
6. The heating system has a TPRV set at 3 Bar.

ELECTRASTREAM PLUS ONLY

7. The Accumulator Pressure is factory set at 2 Bar.
8. The recommended Accumulator Pressure is 1.5 Bar below the mains pressure with an absolute minimum of 0.8 Bar - see 5-1, Stage 9. Consult GAH (HEATING PRODUCTS) for further information.

4-7 Electrastream Connections

4-7.1 Connections to Electrastream - BEL125 and BEL150 Single Coil Cylinders

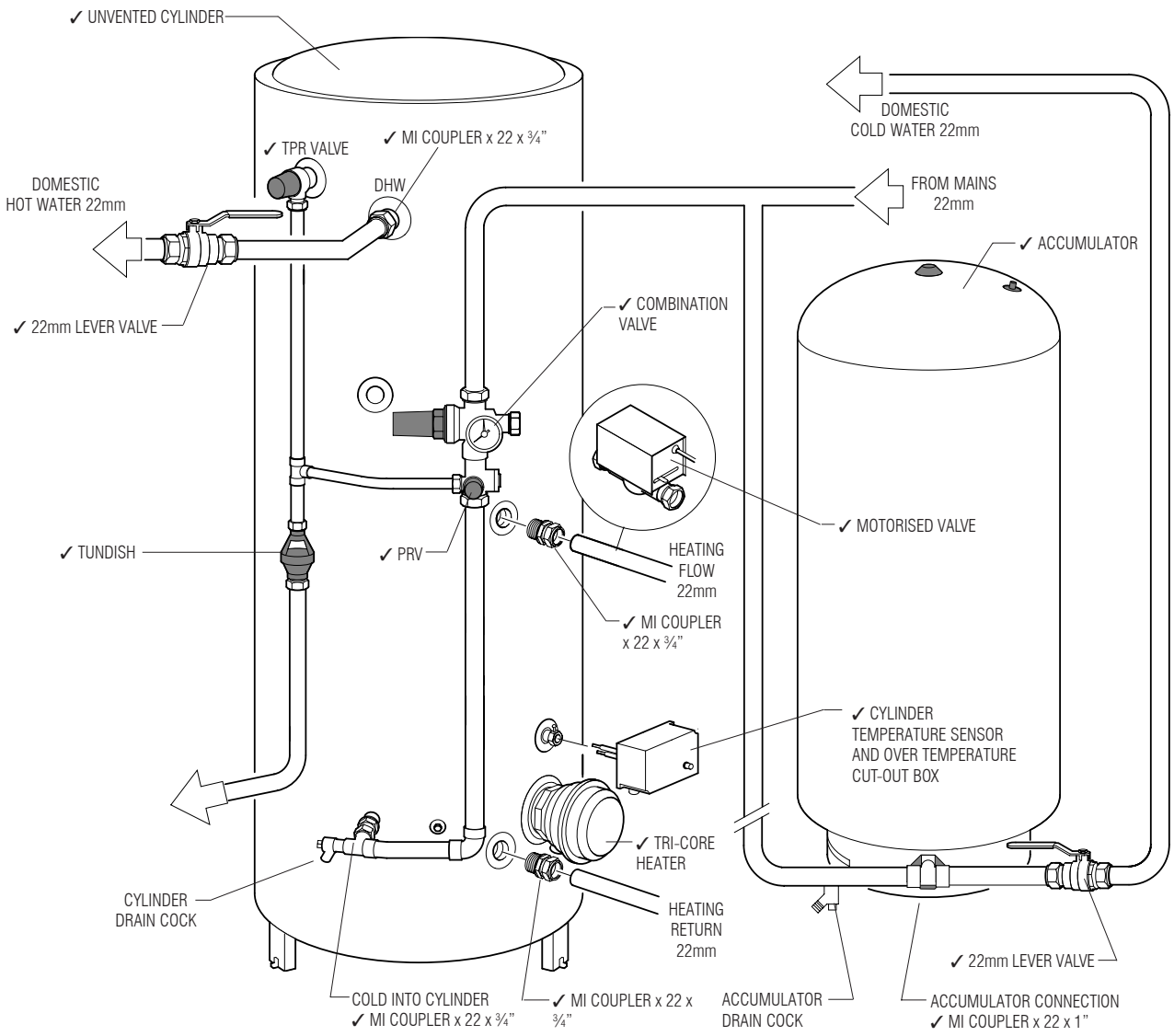

✓ UNVENTED CYLINDER
DOMESTIC COLD WATER 22mm
TPRV connection not to be used for any other purpose
✓ TPR VALVE
✓ MI COUPLER x 22 x ¾"
DOMESTIC HOT WATER 22mm
DHW
✓ 22mm LEVER VALVE
✓ 22mm LEVER VALVE
✓ COMBINATION VALVE
FROM MAINS 22mm
✓ DHW 8l EXPANSION VESSEL KIT
No valves between combination valve and vessel
PRV
HEATING FLOW 22mm
✓ MI COUPLER x 22 x ¾"
✓ TUNDISH
No valves between cylinder and combination valve
Discharge to be arranged and sized to comply with Building Regulations G3.
✓ MOTORISED VALVE
✓ TEMPERATURE SENSOR AND OVER TEMPERATURE CUT-OUT BOX
✓ TRI-CORE HEATER
CYLINDER DRAIN COCK
HEATING RETURN 22mm
✓ MI COUPLER x 22 x ¾"
COLD INTO CYLINDER
✓ MI COUPLER x 22 x ¾"

Domestic Hot Water	22mm	22 x ¾" M.I. Coupler - supplied Fit 22mm Lever Valve - supplied
Domestic Cold Water	22mm	Fit 22mm Lever Valve - supplied
Mains Supply	22mm	22mm x ¾" BSP M.I. Coupler - supplied
Tundish	-	Discharge to be arranged and sized to comply with Building Regulations G3.
Boiler Flow	22mm	22 x ¾" M.I. Coupler - supplied
Boiler Return	22mm	22 x ¾" M.I. Coupler - supplied

✓ PARTS SUPPLIED

Fig. 4-7a Typical Electrastream Single Coil Cylinder Connections

4-7.2 Connections to Electrastream Plus

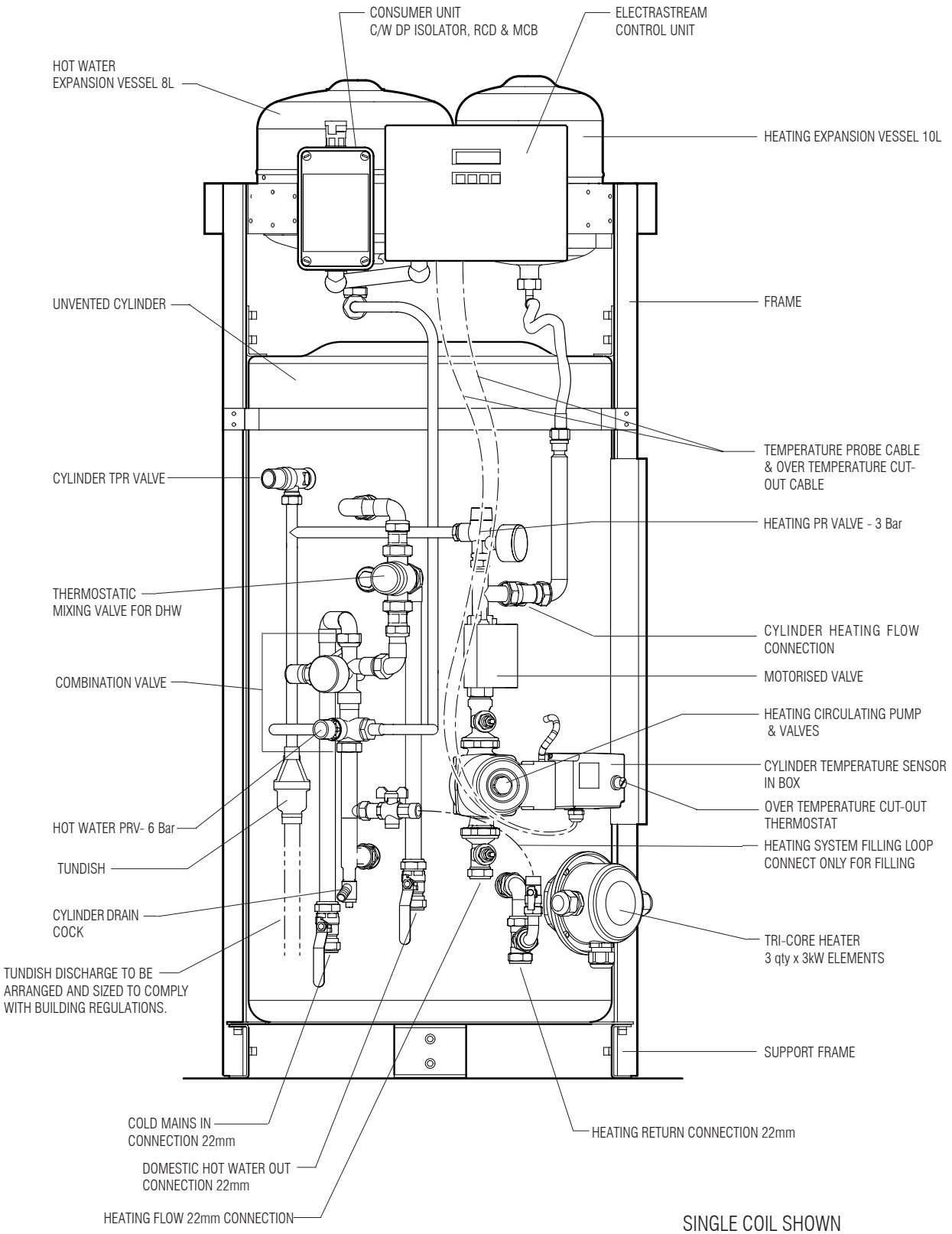

✓ UNVENTED CYLINDER
✓ TPR VALVE
✓ MI COUPLER x 22 x ¾"
DOMESTIC HOT WATER 22mm
DHW
DOMESTIC COLD WATER 22mm
FROM MAINS 22mm
✓ ACCUMULATOR
✓ 22mm LEVER VALVE
✓ COMBINATION VALVE
✓ MOTORISED VALVE
✓ TUNDISH
✓ PRV
HEATING FLOW 22mm
✓ MI COUPLER x 22 x ¾"
✓ CYLINDER TEMPERATURE SENSOR AND OVER TEMPERATURE CUT-OUT BOX
✓ TRI-CORE HEATER
CYLINDER DRAIN COCK
HEATING RETURN 22mm
✓ 22mm LEVER VALVE
COLD INTO CYLINDER ✓ MI COUPLER x 22 x ¾"
✓ MI COUPLER x 22 x ¾"
ACCUMULATOR DRAIN COCK
ACCUMULATOR CONNECTION ✓ MI COUPLER x 22 x 1"

Domestic Hot Water	22mm	22 x ¾" M.I. Coupler - supplied Fit 22mm Lever Valve - supplied
Accumulator Connection	22mm	22 x 1" M.I. Coupler - supplied
Domestic Cold Water	22mm	Fit 22mm Lever Valve - supplied
Mains Supply	22mm	22mm x ¾ M.I. Coupler - supplied
Tundish	-	Discharge to be arranged and sized to comply with Building Regulations.
Boiler Flow	22mm	22 x ¾" M.I. Coupler - supplied
Boiler Return	22mm	22 x ¾" M.I. Coupler - supplied

✓ PARTS SUPPLIED

Fig. 4-7b Typical Cylinder Connections - Electrastream Plus

4-7.3 Connections to Electrastream Pre-Piped



IMPORTANT
Plumbing must remain as supplied.
Do not add to or change any plumbing or connections.

Fig. 4-7c Electrastream Pre-Piped Connections

5-1 Commissioning

IMPORTANT It is the responsibility of the installer to ensure that the Electrastream System is properly commissioned.
Should the commissioning not be carried out, then the manufacturers guarantee and any extended warranty, will become null and void.
The Guarantee Form MUST be completed and returned to GAH (HEATING PRODUCTS) in the prepaid envelope provided.

Note
DHW = Domestic Hot Water.

The Commissioning Procedure should be carried out in 10 stages.

- ☐ Stage 1 Electrical Check.
- ☐ Stage 2 DHW Pre-fill Check.
- ☐ Stage 3 Filling DHW System
- ☐ Stage 4 Drain DHW System
- ☐ Stage 5 Cleaning DHW System
- ☐ Stage 6 Heating System Pre-fill Check
- ☐ Stage 7 Flushing and Filling Heating System
- ☐ Stage 8 Setting and Testing Controls
- ☐ Stage 9 Accumulator Pressure
- ☐ Stage 10 Handing Over

Commissioning Procedure

STAGE 1 - ELECTRICAL CHECK

1.1 CHECK THAT ALL WIRING INCLUDING EARTH WIRING, HAS BEEN INSTALLED CORRECTLY, CONFORMS TO CURRENT REGULATIONS AND A SATISFACTORY ELECTRICAL TEST AND INSPECTION CERTIFICATE HAS BEEN COMPLETED.

1.2 CHECK TRI-CORE HEATER COVER, ELECTRASTREAM CONTROLLER COVER AND ALL OTHER ELECTRICAL COVERS ARE CORRECTLY FITTED.

1.3 Check Tundish is positioned so that any spillage or spray from the Tundish would not contact any electrical components.

1.4 Check ALL wiring connections have been made.

Check cylinder temperature sensor is connected to 'temp sensor' terminals 3 & 4.

Check cylinder over temperature cut-out is connected to 'O-T' terminals 1 & 2 (see figs. 3-3a and 3-3b).

1.5 Check the required earth continuity conductors have been fitted.

STAGE 2 - DHW PRE-FILL CHECK

2.1 Check the hot water heating discharge pipes and Tundish are correctly installed to conform to the Building Regulations G3.

2.2 Check all pipe connections are tight and no joints have been left unsoldered.

2.3 Check ALL drain cocks are closed.

2.4 If fitted, check that the Scale Protection Device or Water Softener has been fitted according to manufacturers instructions.

STAGE 3 - FILLING DHW SYSTEM

3.1 Open all shut off valves.

3.2 Open the incoming water isolating valve (mains stopcock) to the Electrastream and allow the unit to fill.

3.3 Open all domestic taps in turn to purge air.

3.4 Check system for leaks including around the Tri-Core Heater.

3.5 Check no water is discharging from any TPRV or PRV.

3.6 Test the operation of the TPRV and PRV by turning the manual test cap and ensure the water flows freely and safely to waste.

3.7 Test the operation of the Combination Valve PRV by turning the manual test cap and ensure the water flows freely and safely to waste.

3.8 Set hot water Mixing Valve to 'max.'

STAGE 4 - DRAIN DHW SYSTEM

4.1 Turn off incoming water isolating valve (mains stop cock).

4.2 Using hose and suitable containers, drain all water from the cylinder and pipework using drain cocks. The cylinder will not fully drain without the use of a hose - see page 36.

4.3 Remove and clean in-line strainer of combination valve, see 4-3.3. Replace.

STAGE 5 - CLEANING DHW SYSTEM

5.1 Using proprietary chlorination product, chlorinate the domestic hot water system as per manufacturer's instructions.

5.2 Drain the system as 4.2, then fill and drain to flush as many times as recommended by the chlorination product manufacturer.

5.3 Refill system.

STAGE 6 - HEATING SYSTEM PRE-FILL CHECK

6.1 Check filling loop is fitted correctly.

6.2 Check all radiator valves are fitted and tight.

6.3 Check all radiator air vents are closed.

6.4 Check all drain cocks are closed.

STAGE 7 - FLUSHING AND FILLING HEATING SYSTEM

7.1 Carry out fill, only after DHW system has been flushed and cleaned.

7.2 Close all radiator valves.

7.3 Connect filling loop and fill heating pipes using last radiator in line to bleed air.

7.4 Check for leaks

7.5 Using hose and/or suitable container, drain heating pipes.

7.6 Repeat flushing pipes as required and fill.

7.7 Open radiator valves and bleed air to fill all radiators.

7.8 Drain heating system again.

7.9 On final refill, add proprietary additives as manufacturers instructions. Fill to 1 Bar.

7.10 Set pressure gauge red arrow to the black arrow (cold fill pressure - 1 Bar).

IMPORTANT

The final fill of the heating system should include the correct dose of a suitable scale/corrosion inhibitor.

5

STAGE 8 - SETTING AND TESTING CONTROLS

8.1 Switch on Electrastream mains isolator.

On Electrastream Control Unit - see 2-2

8.2 Set date and time.

8.3 Set times to suit economy tariff.

8.4. Set target temperature to 65°C - (step 8 on 2-2b).

8.5 If heating/hot water is not On press Boost + and set room thermostat for heat.

8.6 Wait for the cylinder and heating to heat up.

8.7 Check for leaks and bleed the system again when it is up to temperature.

8.8 Check pressure gauge black arrow, this will show the heating system working pressure. This should be less than 2.8 Bar.

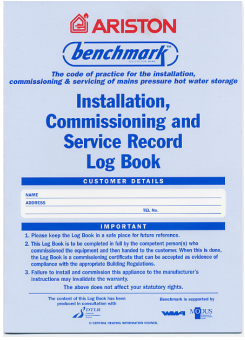
8.9 Check operation of Electrasteam Control Unit.

HEAT 1 ∧ Indicates Element 1 is ON
HEAT 2 ∧ Indicates Element 2 is ON
HEAT 3 ∧ Indicates Element 3 is ON
} Cylinder is heating up

VALVE ∨ Indicates Heating Valve is OPEN
PUMP ∨ Indicates Heating Pump is ON
THERM ∨ Indicates Room Stat is calling for heat.
} Heating is On

When timer is set for heat and the room thermostat is set above ambient - the motorised valve should be open and the pump should be running. When the room thermostat is reset below ambient the pump should stop and the valve should close. When the timer is not set for heat, the pump should not run and the valve should be closed regardless of room thermostat setting.

8.10 Fill in details in the Benchmark Logbook.


ARISTON
benchmark
The code of practice for the installation, commissioning & servicing of mains pressure hot water storage
Installation, Commissioning and Service Record Log Book
CUSTOMER DETAILS
IMPORTANT

CAUTION

The main supply must be turned OFF and water drained from the Accumulator before lowering the charge pressure, failure to do so could result in damage to the diaphragm.

If in doubt consult GAH (Heating Products).

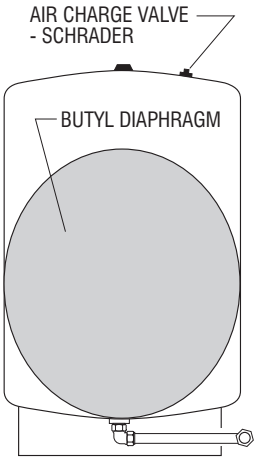


Fig. 5-1a Accumulator Pressure

STAGE 9 - ACCUMULATOR PRESSURE

Accumulators are supplied by GAH with a preset air charge of 2 Bar (28/30psi). The Combination Valve supplied with the Electrastream Plus has an integral pressure reducing valve fixed at 3.5 Bar. Therefore there is a pressure differential of 1.5 bar between the system pressure and the air charge of the Accumulator.

When the incoming mains pressure is less than 3.5 Bar the pressure differential will be less than 1.5 Bar and the Accumulator will not fill sufficiently, therefore it may be necessary to lower the Accumulator air charge pressure.

The procedure for changing the Accumulator pressure is given below, this can be done before the system has been filled. It may be done after the system has been filled and tested, providing the incoming main has been turned OFF and the water drained from the Accumulator. Failure to do this may result in false pressure reading and damage to the butyl diaphragm.

If mains pressure is 3.5 Bar or above, changing the Accumulator charge pressure will not be necessary.

Adjusting Air Pressure

9-1 Record mains pressure.
9-2 Turn main supply OFF.
9-3 Turn on cold outlets to empty Accumulator.
9-4 Remove black cap from top of Accumulator check/confirm Accumulator pressure with pressure gauge.
9-5 Lower air charge so that is 1 to 1.5 Bar below mains pressure. Minimum Accumulator pressure is 0.8 Bar.

STAGE 10 - HANDING OVER

10.1 Complete the Guarantee Form, the top sheet of this MUST be sent to GAH (HEATING PRODUCTS) LIMITED or the Electrastream can be registered on-line at www.gah.co.uk.

10.2 Complete the Benchmark Logbook.

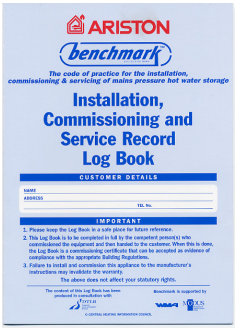
10.3 The Installer should re-check the system and ensure it is completely satisfactory before demonstrating to the end user.

10.4 The end user should be aware of the following:-

1. The most cost effective use of the Electrastream system using economy and standard tariffs.
2. How to set the temperature of the tap hot water (Mixing Valve).
3. How to set all Electrastream Controller functions.
4. How to set room thermostat.
5. The function of the Pressure Relief Valves and Combination Valve and that over pressure will cause steam and scalding water to be emitted from the discharge pipes.
6. That the Tundish is supplied as a visual identification for over pressure.
7. The procedure to follow in the event of over pressure. Refer to Fault Finding (section 7).

10.5 This manual and supplements must be left with the end user together with a copy of the completed Guarantee Form.

6-1 Routine Service



IMPORTANT
Also carry out any service requirements of specific components as specified by the manufacturers instructions.

Note
If heavy scaling is evident then descaling the system is recommended. Ensure system is fully flushed following descaling.

IMPORTANT
The final fill of the heating system should include the correct dose of a suitable scale/corrosion inhibitor.

Note
Testing the RCD will not affect the operation of the Electrastream Control Unit.

The Electrastream system should have a routine service at least once in 12 months.

IMPORTANT Always turn off the heating system and electricity supply to the Electrastream before removing covers and working on the Electrastream System - this includes the room thermostat cover.

6-1.1 Service Procedure

1. Confirm with the customer the unit's service history and locate Benchmark Logbook.
2. Check cylinder model and serial number is listed in the Benchmark Logbook.
3. Visually inspect cylinder/s and vessels for damage, metal failure and signs of leaks.
4. Visually inspect all Electrastream pipework for damage, metal failure and signs of leaks.
5. Set control unit to midnight to run self test and check Electrastream control unit for error messages (see fig. 2-2a).
6. Record mains pressure, system pressure and heating operating pressure.
7. Turn the heating OFF at Electrastream Control Unit.
8. Turn the electrical supply to the Electrastream OFF at the isolating switch.
9. Momentarily open the combination TPR Valve and check that the water drains freely and safely to and from the tundish.
10. Open combination PRV momentarily and close, valve should shut off. Repeat if valve sticks. If valve will not shut off replace valve.
11. Open heating TPRV momentarily and close, valve should shut off. Repeat if valve sticks. If valve will not shut off replace valve.
12. Close the Stop Cock.
13. Open the hot and cold taps, attach a hose to the cylinder drain cocks and empty the system.
14. Remove tri-core heater, remove limescale and examine the element and seal. Refit if in good condition.

    In hard water areas it is probably better to replace the tri-core heater if heavily scaled. Fit tri-core heater and seal.
15. Clean and check the in-line strainer in the combination valve - replace if required.
16. Check strainers and operation of mixing valve, see 4-3.10.
17. Close all drain cocks and refill system.
18. Check that no water is passing through the Combination Valve or the Pressure Relief Valves, this will be evident at the Tundish.
19. Switch on the Electrastream isolator, set timer for midnight then set Control Unit and room thermostat for heat.
20. Wait for the system to self check and heat up.
21. Check temperature of hot tap water, adjust as required, max. 60°C.
22. Check for leaks and bleed system again when the system is up to temperature.
23. Check operation of room thermostat and timer.
24. Check the RCD operation.
25. Enter details of service into the Benchmark Logbook.

6-1.2 Replacing Tri-Core Heater

When replacing the Tri-Core heater the relays on the Electrastream Control Unit must be checked for operation:-

1. Heat cylinder.
2. Observe the Control Unit and wait for the actual temperature °C to reach the set target °C (65°).
3. When set target °C is reached, Heat 1, Heat 2 and Heat 3 will indicate all elements are off (not displayed).
4. If a continued rise is observed when Heat 1, Heat 2 and Heat 3 show that all elements are OFF, it indicates that the relay on the Control Unit needs replacing. Consult GAH (HEATING PRODUCTS).

7-1 Fault Finding - also see www.gah.co.uk

For Error Displays on control unit refer to 2-2.3 page 18.

● Indicates that the check may possibly be carried out by the system user.

❍ Indicates that the check should be carried out by the installer or competent person.

IF IN DOUBT CONTACT YOUR INSTALLER.

No COLD Water Supply

- ● Check the mains water supply has not been interrupted.
- ● Check the stop cock and all valves on the mains water supply are correctly installed.
- ● Check the stop cock and any valves on the mains supply are fully open.

Reduced Pressure

- ● Check the stop cock and any valves on the mains supply are fully open.
- ❍ Check the combination valve in-line strainer is not blocked - clean or replace as required.
- ❍ Check strainers and any other fittings are not blocked - clean or replace as required.

No Hot Water/Heating

- ● Check the power to the Electrasteam is ON - isolating switch and neon should be ON. If not check the RCD or MCB have not tripped. If one or both have tripped, consult your installer.
- ● Check for error messages on the Control Unit display, see 2-2.3.
- ● Check timers and target temperature on Electrastream Control Unit (see 2-2b) are set correctly.
- ● Check over temperature cut-out, see 2-1.3.
- ● Check mains supply - it may have been interrupted.
- ❍ Check cylinder thermostat probe is installed correctly.
- ❍ Check 16amp resettable thermal trips and 5 amp fuse in Electrastream Control Unit.
- ❍ Check strainers and operation of mixing valve.
- ❍ Check cold water combination valve is fitted correctly.
- ❍ Hold probe in hand to check temperature rise/correct operation of probe.

Water Leaks

In the unfortunate event of a water leak from the Electrastream cylinder, TURN OFF ELECTRIC SUPPLY, then turn off the mains water supply to the house via the stop cock. Make allowance to store some cold water for necessities. Open both cold and hot taps to drain the cylinders of water thus preventing any further leaks and consult your installer.

Poor Flow Rate

- ● Check all isolation valves are fully open.
- ❍ Check in line strainers and operation of mixing valve.
- ❍ *Check accumulator charge pressure is correct - refer to section 4-6.

** Electrastream Plus only*

Good volume which falls away too quickly

- ❍ *Check accumulator charge pressure is correct, refer to section 4-6.

Cold water discoloured

- ● Check mains supply - it may have been interrupted.
- ❍ Check water softener (when fitted) is operating correctly.
- ❍ *Check to make sure there is air charge pressure in the accumulator. If air is not present, suspect faulty accumulator. Consult GAH (HEATING PRODUCTS).

** Electrastream Plus only*

Hot water discoloured

** Electrastream Plus only*

In the event of water/steam being seen at the discharge pipe or tundish

WARNING
Scalding water and steam can be blown out of the tundish and discharge pipe

WARNING
Please ensure that no water has come into contact with any electrical device before the electrical supply is turned back on.

- ❍ Indirect cylinder coils may be fractured, consult GAH (HEATING PRODUCTS).
- ❍ *Check to make sure there is air charge pressure in the accumulator. If air is not present, suspect faulty accumulator. Consult GAH (HEATING PRODUCTS).

Make the system safe

- ● Turn off the system at the isolator or consumer unit.
- ● Turn on a hot tap until it runs cold to reduce the pressure and temperature.
- ● Turn on the radiators - ensuring all thermostatic valves are open.
- ● Contact the installer.

Investigate possible causes

- ❍ Check there are no restrictions in the hot water pipework.
- ❍ Check for loss of pressure in the hot water expansion vessel.
- ❍ Check for loss of pressure in the heating expansion vessel.
- ❍ Check pressure reducing valve (on combination valve, see 4-3.3).
- ❍ Check for back feed of high mains pressure from expansion valve.
- ❍ The heating system should not be run with all the radiators turned off unless there is a bypass valve in the system, see figs. 1-2a and 1-2b.
- ❍ Check for air in the heating system.
- ❍ Check that the cylinder temperature sensor has not been dislodged from the phial in the cylinder.
- ❍ With the heating elements and heating pump turned OFF, check for error messages on the Electrastream Control Unit.
- ❍ With the heating elements and heating pump turned OFF, check the target temperature of the Electrastream Control Unit (see step 8, fig. 2-2b).
- ❍ With the heating elements and heating pump turned OFF, check for error messages on the Electrastream Control Unit.

Notes

electrastream
controllable electric boilers

heating products

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